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PRESIDENTIAL ADDRESS*

Woman in This Changing World

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IT IS appropriate and customary on this occasion for one who has been chosen as your President to acknowledge his appreciation of the honor conferred by his selection for this high office. Accordingly, in all humbleness, I am prepared to do so. For to have headed, by force of circumstances for a period of two years, one of the oldest organizations of specialists in that branch of medicine to the progress of which it has devoted itself, is a distinction which merits this personal expression of gratitude and appreciation.

Among the duties devolving upon your President is that of making the Annual Address. Although it is a pleasant duty, the choice of subject necessarily constitutes for him a problem and as one looks back through the Society's Volumes of Transactions for suggestions from his predecessors, it becomes evident that the assignment has not been a simple one, for many of the incumbents of this high office have ventured outside the clinical fields with which perhaps they were most familiar, and have discussed a variety of academic and historical subjects. It is a temptation for an older man, and most of our Presidents were no longer young when they occupied this position, to select a topic with a literary flavor, or with a hero in obstetrics or gynecology as their subject. For this gave opportunity for pleasant reading and I was tempted to do the

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same. However, I found that most of the great men of the past whose careers were identified with our speciality, had been resurrected for this purpose, so I had to look elsewhere. Whether I have made a suitable choice must be left to my audience. For I want to venture into another field, a field which should be viewed by all physicians, and especially our particular group, with interest, with sympathy, and with understanding, for its discussion bears directly on the problems within our own sphere, which should deal with the welfare of womankind in general. And so in entitling my address, "Woman in This Changing World," I feel that I may have opened up a subject for discussion so endless and so volatile, that any hoped-for solution of the problems associated with it probably is impossible, at least in this immediate day and age. For one cannot fail to acknowledge the new position, social, economic, and even physical, which woman has assumed in this last century, and particularly, in these recent years since the world has become involved in a global conflict. For war has expedited the evident changes in our accustomed lives, and in this connection there are many contributing factors which cannot be overlooked, even if they bear only indirectly on our topic.

War, in a sense, has always afforded a stimulus to social progress, as well as in the field of the arts and sciences, and upon medicine devolves both the need primarily to care for war's participants wounded in conflict, as well as those in civil life affected by its destructions. War speeds the more rapid development of new measures in medical as well as in other fields. On the one hand, science has been called upon to expand its efforts to devise more effective ways to maim and to kill and on the other, to reduce the toll of the necessary fatalities and to care for those injured both in mind and in body. The former efforts are coexistent with the period of the war, the latter must be carried over into the restoration of the peace. What a boon to humanity has been the impetus to combat infection and shock, for example, by means previously slow to be adopted—chemotherapy, transportable blood plasma, and other procedures, now generally accepted. But these will contribute only in a restricted sense to the problems in which we are interested as specialists in a limited medical field. For woman will continue to present her problems, her physiology and her biologic status have not and cannot well be altered. Yet in this particular war, we have subjected her to strains and stresses far beyond what were formerly regarded as her natural capacities. In consequence there have been subordinated, among other things, what we as gynecologists must continue to regard as her natural functions, among which motherhood remains the most important. For, trite as the remark may seem, without motherhood, the world, as we know it, would cease to exist. Woman today continues her striving to become, what she terms, emancipated—she wants to be on a level with man—politically, socially, even physiologically. Perhaps this leveling process will benefit mankind, a mere male would be ridiculed and cast out if he disputed the aspiration. But seemingly, in this movement, priority is

no longer given to motherhood, modernism denies that this is the sole purpose of the sex. Admitting certain favorable results that have come from all this striving, can we set aside the hitherto accepted distinction between the sexes which Nature has ordained? There can be no human hybrids as there are among animals and plants developed solely for strength or size or beauty, but not for reproduction of their kind. And so while we may accept and perhaps welcome the advances which women have attained for themselves, there must eventually develop a limitation to these ambitions if there is to remain a bisexual world. For who will deny that the latter is an essential factor in the life of the planet which provides us with a habitation? Perhaps the situation is different on Mars—I do not know. At least on this earth, we are men and women, distinct as Nature had intended.

Therefore, 'one might view with some doubt the validity of certain statements made by Captain Mildred McAfee, President of Wellesley and now the Commander of the Waves, in a recent address in which she called upon women college graduates to face responsibilities as "people" and not just as "women," for people as such, she claimed, are more important than men and women. The interpretation of this claim probably will vary with the individual reader, but would it not be better if, in admitting that women must do their part in carrying the common load, as she likewise acknowledges, that they do so as "women" and not merely as "people"? I cannot be made to believe that this is a distinction without a difference.

Woman has climaxed her previous efforts in this World War II and, as one studies the statistics of woman's participation in the present conflict, one is amazed by its extent. For it is not only the home front which is involved, the battle areas themselves have called into action large numbers of women as nurses, social welfare and canteen workers, the Waacs, the Waves, and others, impressed to supplement man power and to relieve men for more important actual combatant duties. The activities of women in this war are manifold, they do almost everything except to serve the actual weapons of death and destruction. And from all accounts, they have made themselves so invaluable by their excellent services, that the commanders in the field are asking for reinforcement of their ranks. The appeal made through the press, the radio, and the lecture platform is directed to the patriotism of women, it presents the glamorous aspects of wartime service and its attractions are set forth in glowing colors. But one may have doubts of the value of taking women away indiscriminately from their previously accepted duties and responsibilities. Less glamorous perhaps is the endeavor to enlist women in industries involved in the war effort, industries which had never employed women and in occupations formerly closed to them. This concerns not only single but married women. The Bureau of the Census may be quoted as stating that in March, 1942, there were 7,600,000 persons in this nation's labor reserve who said they were available for

full-time employment, of which 7,000,000 were women, most of whom were engaged in "Housework." In November of that year, the reserve had been reduced to 5,000,000, of which four and a half million were women, most of them married. These figures indicate that approximately 2,500,000 women were employed in war industries or other related activities during the intervening eight months. Today, their numbers undoubtedly are greater. These additions to available labor supply necessitated the introduction of many measures for health conservation, particularly in factories. A large proportion of these recruits to industry were in the 18- to 44-year group, namely in the childbearing age. As Dr. Charlotte Silberman of the Federal Children's Bureau stated in a recent admirable study of the subject, "it is difficult to obtain reliable figures of the incidence of pregnancy among women factory workers. Where satisfactory records were available, it was found that there were from 3 to 6 cases per 1,000 women per month." It should be noted, moreover, that more than 50 per cent of women workers were married, and this percentage will increase as the labor market narrows. It is unlikely however, that the reporting of pregnancy is accurate, there are so many more things to occupy factory managers. Nevertheless, maternity policies have had to be developed in industry, including the granting of leaves during pregnancy and for the necessary aftercare, all of which must exert a disturbing effect on labor turnover.

And in this connection, we must consider not only pregnancy in the increasing employment of women in industry but a multitude of other factors. The physical strains imposed on women workers have necessitated more stringent rules and regulations in their employment as regards absenteeism during certain periods, protection against hazards, hours for rest, as well as provisions for the care of the household and for unattended children left at home. This has constituted in many instances, a serious community problem, and brings us up sharply in evaluating woman's status as between being a war worker and a homemaker. Thoughtful women have voiced the dangers of these changed conditions in the home from a peace to a war footing. Providing shelter, clothing, food, family supervision, and elemental instruction, are responsibilities incumbent upon parenthood. But right now, the home is "short" on mother's time, and without it, the American home cannot function adequately. If these necessities cannot be supplied, the coming generation will be the sufferer. Already the growing incidence of juvenile delinquency has become a major problem. If we are to have a satisfactory postwar existence and an enduring peace, with the possible social upset brought about by woman's changing status, a beginning must be made now. The rush of women into war industry has deprived the home of maternal influences. The absence of mothers means the care of the younger children by outside agencies, and no care at all, in many cases, of the adolescent boys and girls. We are appalled by accounts in the newspapers of the rise of juvenile delinquency. But in

view of the lack of parental influences, we need not be surprised that great numbers of the rising generation have strayed from the paths of even ordinary decency and behavior, from mere mischief into actual crime. The police and social agencies are faced with a problem, the solution of which is a matter less for them than for the mothers of the nation. Homes disrupted by influences which should not have prevailed must be restored not from without but from within. The obligations of parenthood cannot be set aside. We are being deluded by the talk of population increase which is based on the bumper crop of babies reported in these recent years. After this, as after other wars, there will come a decline in births, and every child life saved today will have a substantial reflection on our future happiness and prosperity.

Let me quote in furtherance of the foregoing from a recent address by Margaret Craig of the School Health Bureau of the Metropolitan Life Insurance Company, who claims that the entrance of mothers into the war effort has had a deleterious effect on their children and, as she expressed it so well, a "rootless generation" is growing up, especially in the highly urbanized states. She said and very properly, "there seems to be a wholesale rejection of children in lieu of other interests based on the demands of living in a world at war. Where there should be more care and supervision, children are given too much responsibility for their years to carry." Citing the rise in juvenile delinquency, she asserted that "undemocratic habits of behavior are being established and children's sense of values are being thwarted because of the lack on the part of parents in establishing an environment where the real and fundamental things of life are given first place."

The figures previously presented of the number of women who have left occupations associated with activities long accepted as their province, afford an idea of the problems which must be faced in the near future. Their sudden adaptation to modes of life previously foreign to them must have had a psychologic as well as a physical effect. In a sense, they have been soldiers, or they have been made to believe that they are such. The transition from a peaceful existence into one with an entirely foreign environment, which subjects women to strains and stresses often different from previous experiences, may in many instances have been necessary and essential but, eventually there must come a time for readjustment, and we may need to formulate rehabilitation methods for women who have temporarily been absorbed by war industries just as we are doing for the returning soldiers. It will not be a simple matter although fortunately, women are more adaptable than men.

Another particular problem associated with the war, which is causing some concern, deals with the behavior of women to invalided soldiers returning to their homes. A man blinded or without a limb, discharged from a hospital with wounds healed but with a shattered mind, shell shocked, or racked with the aftereffects of tropical fevers—how

shall he be cared for, how helped to overcome the depression due to his war experiences? Psychiatric welfare workers, had we enough of them, might solve a part of the problem, but it is the wife, mother, sister, upon whom the greater portion of the burden must fall. For this she must be prepared, and it is to be hoped that her own previous separation from the home while engaged in a war service may not have taken from her that sense of responsibility and that helpful sympathy which is so essential to the successful carrying out of these important functions. And therefore, the rehabilitation of women war workers likewise in this sense is a matter for serious consideration. Who is to do it? I am not prepared to make a satisfactory answer, but I feel that it would be well if some of the propaganda efforts exerted on women through the press, radio, and other sources, as an appeal to their patriotism or the more lurid appeal to their pocketbooks, could likewise be developed in other directions.

The postwar adjustments in family life will involve great numbers of our people. Men and women in the Armed Forces, who may have participated in great historic events, living under conditions of exhilaration and excitement, or those who have labored under the attractions and distractions of other wartime employment, often with immediate high monetary returns, all will have difficulty in adjusting themselves to their former mode of life. There will be problems of the utmost complexity to be solved. For it has been said and very wisely, that "war not only destroys and damages property, it also destroys and damages people." We may include here the many war marriages often contracted on the impulse of the moment and subsequently subjected to periods of separation during which husband and wife undergo completely differing types of experience.

Having discussed certain prominent features dealing with the rapidly changing status of women in this more recent period of unrest in the world, it would appear of interest to review rather briefly the movement which has culminated in this striving for equality between the sexes. Far back in history woman was a slave and chattel, but this undesirable position no longer prevails except among those whom we may call the backward people of the world. After the Middle Ages, when Europe awakened during the Renaissance and later on when migration especially to the North American continent progressed, the property and social rights of women began to be recognized but aside from a few cursory efforts, her political and social status did not advance perceptibly until within the period of the last hundred years, and then mainly among the English-speaking nations.

This advance was designated as a movement of emancipation, emancipation in the sense of attaining equality with man, socially, politically, and economically, a really factual independence guaranteed in many instances by legal decree. The relationship of husband and wife no longer implied that the former was the master of the latter. Woman

attained a position where she no longer considered herself a mere bearer of children with its accompanying responsibilities. She entered, through her own and persistent efforts, the domain of the arts and professions and industry, previously largely sacred to man. She made a demand for greater respect and attention because of her attainments. But whether she will be able to combine all of these newer achievements with her primeval obligations, remains a problem for future adjustment. For speaking biologically, she must continue to exercise, willingly or unwillingly, the functions with which the Creator has endowed her. Calm and philosophical rather than wishful thinking is essential if we are to preserve a world in which the two sexes will reign not as competitors but as co-workers.

The position of woman, in a social sense and otherwise, has undergone great changes in this day and age. It is essentially a record of progress, but where and when will this progress be stabilized? I must admit my inability to make an adequate reply, nor can I with safety or assurance point to any prophet of either sex who would dare to do so. Will woman go on in her career to emulate man and then rest secure in the thought that she has attained this equality, or will she go on beyond this and occupy the stature of the famed Amazons of Greek legend and thus be the superior being physically as now perhaps she is intellectually? In this connection I would like to paraphrase the title of a widely read book written some years ago by Henryk Sienkiewicz, in which there is recounted an ancient legend of the early Christian era. Saint Peter, fleeing from Rome to escape crucifixion as a martyr, meets his Lord Christ on the Appian Way. "Domine, quo vadis?" he explains. "Lord, where goest thou?" "To Rome, to be crucified again," is the reply. And the Apostle turns back to his martyrdom. I do not deem it irreligious if I permit myself to exclaim in a similar fashion, acknowledging the change in time and circumstances—"Femina, quo vadis," "Woman, where goest thou?"

Woman's career in our country has been of signal interest onward from the Colonial Period, through the expanding migration to the unsettled West during the middle of the last century, through the era of the strife between the North and South, and through the later decades when political rights were conferred upon her, and she in considerable numbers, entered the ranks of the professions, business and industry. "The sweep of American culture has brought woman to a near equality with man in almost every aspect of her social career," states Prof. Groves in his book on *The American Woman*, and he regards it as one of the most characteristic and important results of the evolution of the American people. But, he adds very wisely, "although it brings a long continued effort near fulfillment, it is not a solution born of the difference between the man and the woman." To quote further, "although some of the problems may be labeled *finis*, others as perplexing, as compelling, as pressing, although on a higher plane, take their place.

There are three parties concerned as adjustments to the new order are attempted: woman, man, and biologic nature. The third has such commanding authority that if it decides against present trends, society, to survive, must find its way back, driven by pain-pressure to the more ancient ways of man-woman relationship. In the new order woman not only has a more active part, she has assumed a greater social responsibility and she has manifested the same self-determination that possesses man."

These well-expressed thoughts, however, should lead to a searching inquiry in another direction, namely, whether we can balance these social strivings and attainments with what Dr. Groves designates as "biologic nature." And here likewise, we must give attention to the acutely developed changes associated with our present world-shattering conflict.

Naturally, neither peoples nor governments can remain static forever—such changes as are concerned with material matters may be accomplished within comparatively short periods, as history has shown, but biologic changes are only brought about by the extremely slow process of organic evolution. The male and female sexes (all through Nature) have remained separate and distinct, it is only among certain of the lower forms of animal life that bisexual individuals exist, such as the lowly snail which, while it exercises certain instincts, still remains a snail, with limited ambitions to say the least. Men and women may develop equalities in a social sense, but biologically speaking, they must and can only exist as men and women. There is no place for a neuter gender as among the bees.

At a gathering such as this, devoted largely to a consideration of the progress in a recognized medical specialty, it is difficult nevertheless to divorce one's mind from the surrounding upheaval, for the world-shaking political events and social changes that accompany the struggle for a supremacy of arms, must have a bearing on our thoughts of what the future holds in store. If this means a change in our mode of life, man alone will not be concerned, woman must likewise take her part. The equal participation of both sexes in social, economic and other activities, has constituted the basis of a widely distributed propaganda in recent years, which insists that woman is to have equal privileges as a voter, as a wage earner, she is not to be discriminated against in any respect because of her sex. This attitude may be reasonable and justifiable, and in accord with modern thinking, but may it not deprive woman of some of that respect, devotion, and attention which she has always claimed and usually received without question? Probably a man will be designated as narrow and prejudiced, if he fails to agree completely with this tendency, especially when one cannot put aside the thought that the biologic status of woman in this world is incapable of alteration by a decree of law or by edict.

For it must not be forgotten that parenthood and the home are the essential factors in maintaining the world's population balance, its happiness and its prosperity. No matter how far-reaching the striving for independence by either sex and especially by women, that essential cannot be thrust aside. People may say, why this worry when we are having that bumper crop of babies in this country, to which reference already has been made. But when we realize what an inroad the war is making on marriage and home life, there must continue to be a preaching and a plea for the conservation of motherhood. It is estimated that almost three million babies were born in these United States during 1942, in 1943 there may be less. But the birth rate of 21 per thousand of population in 1942, is less than the 25 per thousand of the last war. One of the factors which has brought about the recent increase in births undoubtedly has been the greater number of early marriages due to the induction of our young men into the services. War brides mean war mothers, there may be thousands more of them if the draft continues, but the preparations for motherhood are not given thought in these hurried marriages, nor the responsibilities associated with parenthood. Although it is unfortunate that our young people give so little consideration to the consequences, nevertheless every effort must be made to secure for these prospective mothers the care which their condition demands. The government has taken note of this and has provided through the Emergency Maternity Act the necessary funds for the confinements of the wives of soldiers of the lower ranks. The extent of this activity must become evident from the fact that now over 300,000 women have applied for these services.

The mother is the fountainhead of a normal and successful family life. The latter has sustained some severe shocks in these war years. Not only have families been dispersed by the absence of fathers in the Armed Forces, but the widespread migrations to war production centers have done away with established customs and associations. Thus, families are broken up and have lost their significance in the social structure. Motherhood under these conditions becomes an even greater trial, and the dignity of parenthood has been sacrificed in many instances to expediency. The whole structure of our civilization may be undermined unless we give full recognition to the importance of the mother as the guiding influence in family life, and accord to her that attention which even the demands and exigencies of the war must not be permitted to destroy.

In this connection, it may be of interest to take note of the proposal that women be represented at the conferences to be held for the maintenance of the peace, after the present distraught world emerges from the conflict. It is claimed that there should be as many women as there are men, because women have qualified themselves as participants by their studies of the perplexing problems associated with the war. There are numerous questions to be decided for this postwar world for the

solution of which women perhaps are as well if not better qualified than men, and it is to be hoped that they will be considered by the sex to which they are so closely related. For this has not only been a struggle for power, it is a struggle for the preservation of free thought, of liberty, and of those conditions which will make the future world a pleasant and satisfactory place for mankind. And there is no better striving than that which will insure us that the family and motherhood are the essential factors in its preservation. I feel that here, medicine has a part to play, for it has had an active part in the conduct of the war and likewise it will have equal responsibilities in the peace which, let us hope, is not too far away. It has long been recognized that good health and the welfare of the State in both a social and a political sense are inseparably connected, although the efforts at a solution of the related problems are by no means fully developed or generally accepted.

The advances which have been recorded in preventive measures to check disease in these recent years, constitute an outstanding evidence of progress. This includes noteworthy changes in our own specialty which it is scarcely necessary to detail here. One need only refer among others to the improvements in operative technique, in the handling of malignancies, in substitutional hormone therapy, and above all, in the efforts to lower maternal and infant mortality and morbidity in childbirth. Particularly in the latter field we, as gynecologists and obstetricians, bring ourselves into close relations with the problems of population preservation and maintenance. This may appear an academic subject, yet it has important practical aspects for which physicians must assume a definite responsibility.

The growth and maintenance of population in the past has been largely influenced by natural and social factors, including environment, economic status, migration, etc. Artificial control of childbearing has, in more recent times, likewise received careful study and attention, to a greater extent perhaps by eugenists and sociologists than by the mass of the medical profession. To the latter has been assigned a subordinate task, namely, to carry out recommended procedures. The enthusiasms of the advocates for "birth control," have outweighed to some extent the more conservative attitude of those less inclined to interfere with Nature's dictates. However, there are arguments on both sides which must be carefully considered, without prejudice or hysteria, if we are to arrive at a sane and sensible evaluation of the matter. To begin with, it must be admitted that the medical profession as a whole, has been hesitant to lead or even to participate in any attempted solution of a problem which has been seized upon by groups of well-meaning but often overenthusiastic individuals, who believed that a reformation of our entire social structure would be accomplished by a widespread adoption of their program for the control of conception. Perhaps parenthood in the broader sense, has been governed in the past too largely by chance, and the thought of a controlled parenthood limited to those

who considered themselves more aware of its responsibilities. But it has also become recognized that childbearing has implications which apply not only to the individual but to the status of the race, the community, and the nation. These are factors which we are apt to forget in a wave of enthusiasm for a new and untried movement.

Normal and sustained growth whether in a race or in a tree, would appear essential to stability in many senses. Overpopulation in a country or overgrowth in a forest may perhaps be undesirable. Among the peoples of this earth, the unrestrained growth in numbers of the yellow and brown races in particular has led to the fear that they would in time displace the whites by overrunning the domain of the latter. However, in this connection, we must also admit that what we term a higher degree of civilization, has reduced natural fertility. Although it may take time, we may assume that unrestrained increases among those races which we look upon as inferior, will be subjected to similar influences. In the meanwhile, there is still plenty of room left on this earth to provide adequate living space and nourishment for the expansion of those who believe themselves crowded out. Therefore, the bearing of children and this at the most opportune period of life must be encouraged and not hampered. It cannot be put aside as a subsidiary function by either women or men, it must remain one of the most important and outstanding functions. It should be needless to further expand this point of view.

All of the foregoing should bring us back to our thesis, namely "The position of woman in this changing world." We must acknowledge the fact that it has changed, and we cannot deny that these changes have been radical and revolutionary. On the whole, they may be accepted as indicating progress, but how far this will go is a question for future generations to determine. It has become more than an academic problem.

I trust that what I have said will not be interpreted as in any way belittling woman's efforts to place herself on an equal footing with the opposite sex. Her striving is admirable and not to be criticized, if it can be directed along lines which will not take away from her the high esteem in which she is now held as a woman. She is the equal of man in many ways, but it would prove a dull, drab, and weary world if she no longer maintained that position of love and respect and admiration which is her due. Let us hope that some of the sudden transition brought about by the war may not be a permanent one, in so far as it concerns woman's entry into those fields of activity which are foreign to her natural capacities. For, superior to all other and immediate considerations, women must continue as the mothers of the nation, this is their outstanding function and responsibility.

THE RELATIONSHIP OF GRANULOSA-CELL TUMORS OF THE OVARY TO ENDOMETRIAL CARCINOMA*

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GRANULOSA and theca-cell tumors may be associated with such excessive and abnormal endometrial hyperplasia that a histologic pattern indistinguishable from adenocarcinoma results. Case reports have been published by Dockerty¹, Porter and Bramhall,² Stohr,³ Russell,⁴ and Schroeder.⁵ Dockerty found 3 carcinomas of the endometrium in 32 cases of granulosa-cell tumor, and 1 carcinoma of the endometrium in 10 cases of theca-cell tumor and concluded, in part, that "this incidence of 10 per cent seems more than coincidental and raises the question of the carcinogenic properties of estrin."

Three additional cases are included in the following report and serve as a basis for comparison of theca- and granulosa-cell tumor-induced hyperplasia and true carcinoma of the corpus uteri.

Apart from the effects of granulosa-cell tumors on the endometrium, the whole question of the relationship of the ovary to corpus cancer remains unanswered.

Many authors have presented evidence in support of the opinion that estrogenic hormonal stimulation is a major factor in the causation of carcinoma of the uterus. Herrell⁶ stated that in his experience, carcinoma of the body of the uterus had not been observed in the absence of the ovaries.

Ovarian follicular activity probably continues for variable lengths of time in nonovulating, involutinal ovaries, and is perhaps responsible for post menopausal endometrial hyperplasia as described by Novak and Yui.⁹ But whether or not it may account for the development of corpus cancer is an open question. Reports of authentic instances of carcinoma of the body of the uterus in surgically castrated women would have an important bearing on this question. In a personal communication Dr. F. A. Pemberton states that G. Van S. Smith has reported 3 cases occurring 15 years after bilateral oophorectomy.

Cases of corpus carcinoma in women previously rendered "menopausal" by irradiation have been recorded by Scheffey,⁷ but it is evident from the report by Smith⁸ that recrudescence of ovarian function may occur after heavy irradiation. Therefore, roentgen ray or radium "castration" cannot be taken as an absolute equivalent of surgical castration.

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Jones and Brewer¹⁰ studied the ovaries and endometriums of 68 premenopausal patients with endometrial carcinoma and concluded that the ovaries may function normally, and the uninvolved portion of the endometrium may be normal and respond normally to ovarian stimulation. They believe that the etiologic significance of hyperestrinism, or the unopposed action of estrin in endometrial carcinoma is not shown in their series of cases.

In further investigation of this question, we have studied a series of six hysterectomy specimens, including the ovaries, in corpus carcinoma, in order to determine whether or not hyperplasia of ovarian stroma, interstitial cells or follicular lining cells were associated with carcinoma. This study showed no constant relationship, and it was found that the ovaries were either partially or completely atrophic in all instances. The amount of deeply basophilic mesodermal tissue present in the ovarian stroma, and not demonstrably connected with follicular structures, was variable and while present in considerable amounts in some cases, was almost entirely absent in others. A further series of 15 corpus cancers was studied for histologic comparison with endometrial hyperplasia associated with granulosa-cell tumors.

Examination of such specimens provided an opportunity for comparison of the growth characteristics of corpus carcinoma and the condition of excessive proliferation caused by granulosa-cell tumor.

The most important features of corpus carcinoma are its progressive growth with continuous and irreversible proliferation, with invasion of the myometrium and establishment of metastases. Some of these features are lacking in many true carcinomas and in all reported cases of excessive hyperplasia, including our own.

Case Reports

CASE 1.—Patient, aged 60, para V, menstruation normal with menopause at 45 years. Started bleeding at 52 years of age. Two years later, her physician found a uterus "twice the normal size" and diagnosed myoma uteri. Two years later, she was examined, bleeding had continued, was more severe and quite constant. The uterus was slightly larger and a cystic tumor was felt on the right side posterior to the uterus. Operation was refused.

Not seen until two years later, in May, 1943. Bleeding had continued, was at times profuse, quite constant, often watery, without odor.

The patient had the appearance of malignancy. The hemoglobin was 45 (Sahli). The uterus was symmetrical, three fingerbreadths above the symphysis. The cervix was hard, patulous and exuded friable material. The cystic tumor was approximately two inches in diameter.

A total hysterectomy with bilateral salpingo-oophorectomy was done. At the time of operation, there was some leakage of carcinomatous material from the cervix.

In July, 1943, the patient returned with recurrence in the vaginal vault. X-ray treatment was instituted with improvement, but in September, she returned with symptoms of a partial intestinal obstruc-

tion. A laparotomy was performed, there were no nodules from which a biopsy could be obtained. The pelvis was filled with densely adherent loops of intestine and fibrous fixation of the pelvic tissue. Ascites was present. Nothing could be done to improve the condition which was undoubtedly the result of intensive x-ray treatment. A few days following operation, a fistula occurred between the intestine and vaginal vault which relieved the obstruction. She died in January, 1944, in a small Colorado hospital. No autopsy was obtained.

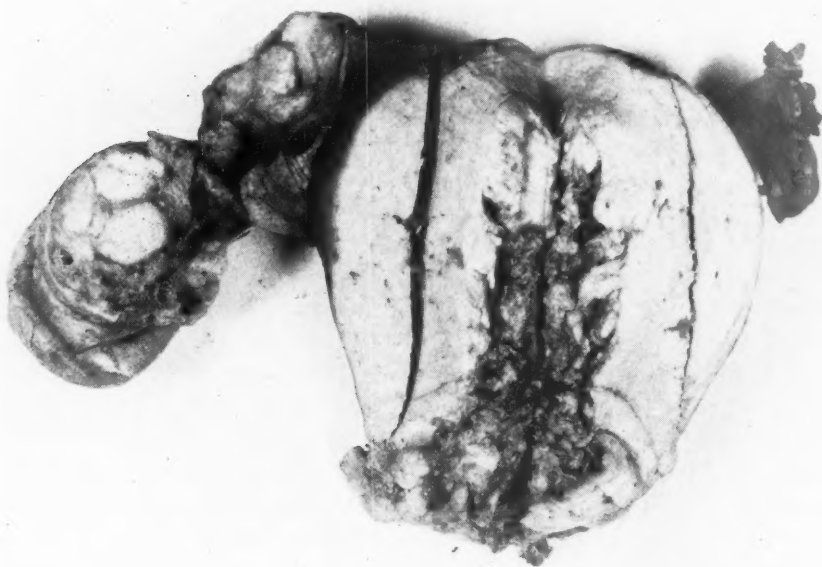


Fig. 1.—Uterus with endometrial and endocervical overgrowth, and granulosa-cell tumor of the ovary.

Gross Description: M. P. 5003. The specimen consists of the uterus, tubes, and ovaries. The uterus measures 11.5 by 8 by 7.5 centimeters. It is enlarged, globular, smooth externally. The myometrium is 2.5 cm. thick, and is pale, uniform without a sharply defined endometrial border. The endometrium is from 0.5 to 2 cm. thick and extends in bays 0.5 to 1 cm. deep into the myometrial wall. It is light gray, polypoid, with several large masses extending downward partially through the endocervical canal. The cervix is large, with thick ragged endocervical lining. The left tube measures 5.5 by 0.4 to 1 cm., being larger, with less evident atrophy than is usually the case after the menopause. The left ovary measures 2.5 by 2 by 0.5 centimeters. It appears to be completely atrophic. The right tube measures 5 by 0.4 to 1 cm. and is similar to the left. The right ovary is incorporated in a partially cystic tumor measuring 7 cm. in diameter. The serous surface is smooth. The cystic portion is composed of the tunica albuginea, forming the wall, and the lining is smooth. The content is serous fluid. The remainder of the ovary is solid with whitish tumor tissue, showing a faint yellowish tinge in some areas, arranged in a coarsely lobular mass measuring 3.5 by 2.5 by 2.5 centimeters. (Fig. 1.)

Microscopic Examination: The ovarian tumor is composed of fibrous stroma infiltrated by cords of basophilic cells, polymorphous, and variable in size and arrangement. A follicular arrangement is found in some fields (Fig. 2), while in others, there are more solid zones made up of closely grouped cords, often with clefts between them. In still others,

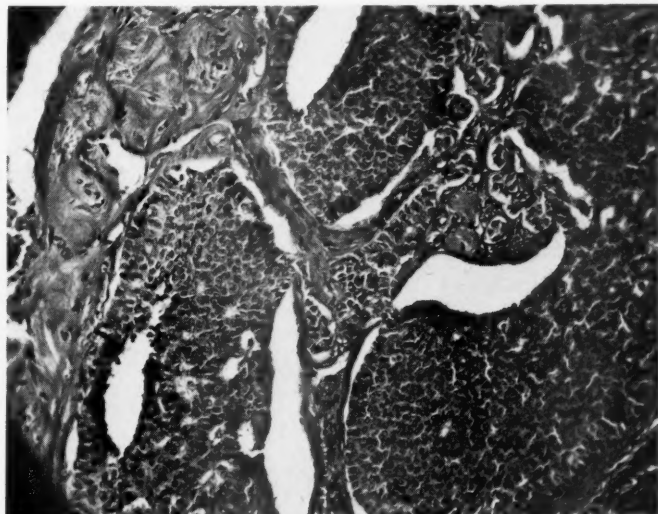


Fig. 2.—Granulosa-cell tumor of the ovary ($\times 170$).

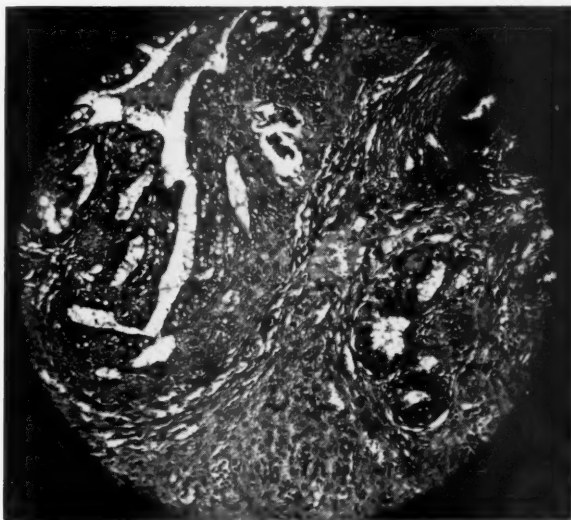


Fig. 3.—Section of cervix, showing hyperplasia and metaplasia of the endocervix ($\times 100$).

the cords extend into the stroma in single units, and in parts a tendency to radial or rosette grouping, with centrally placed Call-Exner bodies is found. Mitotic nuclei are present but not numerous. No evidence of extension through the tunica albuginea or invasion of the mesovarium can be found.

Sections of the corpus uteri and cervix show profound hyperplasia of endometrium and endocervix. In the cervix, the entire canal from the external os upward is lined by irregularly stratified and papillary epithelium, partly squamous and partly mucoid (Fig. 3). There is no tendency toward invasion of the stroma of the cervix.

In the uterus the epithelium is columnar, with abundant mucoid secretion. The arrangement is glandular with papillary excrescences. (Fig. 4.) The cells are uniform in size, with basal nuclei and pale, neutrophilic cytoplasm. Nuclei in mitosis are fairly numerous. The myometrial fibers are large and the uterine wall is thick. The glands are present between muscle bundles, chiefly in the superficial zone. The outer two-thirds of the myometrium also are invaded.

Where endometrial tissue is present within the myometrium, only glandular elements are represented, and endometrial stroma is lacking, which tends to eliminate endometriosis as an explanation of this finding.

The pathologic diagnosis was granulosa-cell tumor folliculoid type, of the right ovary, and adenocarcinoma, corpus uteri.

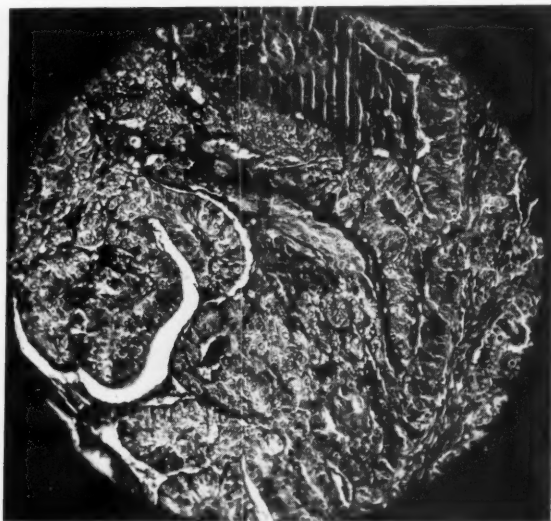


Fig. 4.—Section of uterus showing papillary adenocarcinoma of the endometrium ($\times 100$).

CASE 2.—A. 2714. The patient was a 79-year-old white widow, who had complained of vaginal bleeding for the past 10 years. There was no definite time interval between bleeding spells. She stated that a physician had told her 5 years previously that she had a tumor, but that nothing should be done. Three days before entry, the patient had a severe hemorrhage which stopped with bed rest. On the day of entry another profuse hemorrhage occurred.

Physical examination disclosed a well-developed, well-nourished elderly white woman. The breasts were large, firm, without masses or tenderness. There was a firm movable mass filling the lower abdomen and pelvis. It was irregular, soft, and rose to 4 fingerbreadths below the umbilicus. The vulva was firm, not atrophic. The blood pressure was 180/95.

Laparotomy was performed, disclosing a large ovarian tumor, in part retroperitoneal, strongly adherent to the sigmoid and small in-

testines. The uterus was enlarged and was removed with the ovarian tumor. The immediate postoperative condition was fairly good, but on the following day, the patient became comatose with rapid, shallow respirations. She died 48 hours after operation. Autopsy was performed 3 hours post mortem.

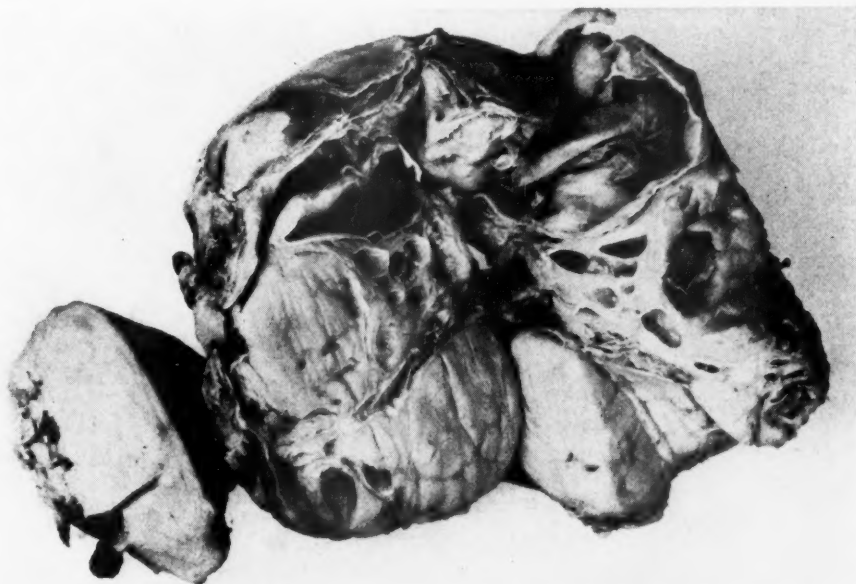


Fig. 5.—Cut surfaces of granulosa-cell tumor of the ovary and attached portion of uterus showing polypoid overgrowth.

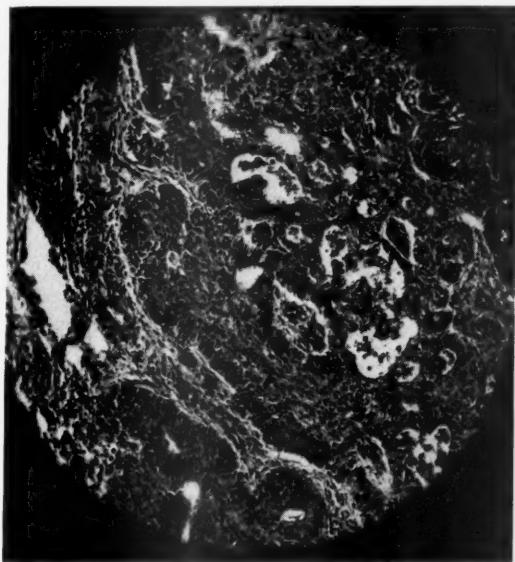


Fig. 6.—Section of uterus showing endometrial adenocarcinoma ($\times 100$).

The surgical specimen consisted of the uterus, both Fallopian tubes, and tumor of the left ovary (Fig. 5). The uterus measured 8 by 8 by 6.5 cm.; the serosa was intact. The myometrium was 1.7 cm. thick, yel-

lowish, and rubbery. The endometrium was unevenly thickened, polypoid, friable, and yellowish. Gross evidence of myometrial invasion was lacking. The right Fallopian tube merged with the ovarian tumor, which was 15 by 11 by 6.5 cm. in size, smooth externally, with shaggy gray-red bands where adhesions had been separated. Cut surfaces of the tumor were partially cystic, with abundant soft faintly yellow lobulated tissue surrounding the cysts. There was one large cyst 5 cm. in diameter which contained a single polypoid tissue mass and was filled with cloudy yellow fluid.

Microscopically, the myometrium was normal, without marked atrophy. The myometrial—endometrial border was uneven, with zones in which both stromal and myometrial invasion by endometrial glands was demonstrable. The endometrium was composed of closely grouped tubular glands with tall columnar epithelium of decidedly atypical appearance (Fig. 6). The gland lumina contained mucin and cellular debris. The epithelial cells were frequently hyperchromatic with

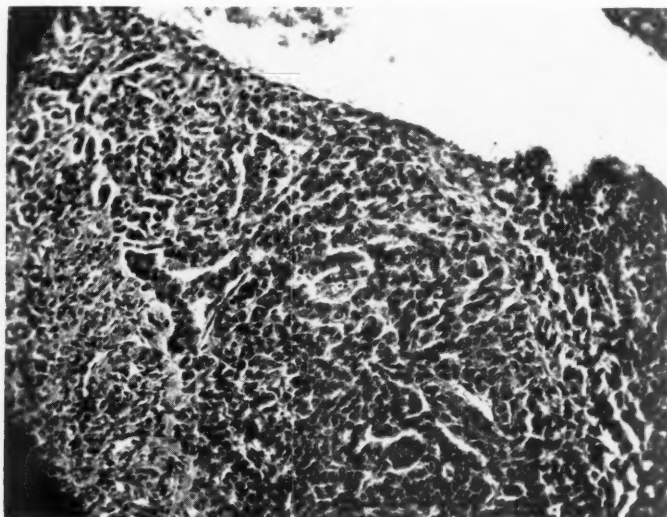


Fig. 7.—Granulosa-cell tumor of the ovary ($\times 170$).

numerous mitotic figures. Islands of squamous cell metaplasia in the glandular structures were present. The large polypoid masses of endometrium were in no way different from the endometrium lining the uterine cavity in general. The hyperplasia was equally great in the fundus and the lower uterine segment, which included the upper portion of the cervix, but did not extend to the external os, which was obtained in the autopsy specimen, and showed normal stratified squamous vaginal mucosa, with several old Nabothian cysts. Above the external os, the endocervix contained normal but autolyzed tubular glands for a short distance, 0.8 cm., and above this point the epithelium was glandular and hyperplastic.

The right Fallopian tube was entirely normal, with no evidence of senile atrophy. The right ovary showed complete senile atrophy.

The ovarian tumor was composed partly of small, dark basophilic cells in coarse lobular grouping, often arranged in trabeculae or rosettes about a hyaline acidophilic central mass. The cysts were lined by multiple layers of these cells, and masses of them nearly filled some cyst

cavities. The remainder of the tumor was made up of small fusiform cells lacking any trabecular arrangement, but tending occasionally to form imperfect rosettes, lying in a fibrous stroma, with marked edema in some zones. (Fig. 7.)

The mammary gland tissue, obtained at autopsy, showed dense fibrous stroma supporting numerous ducts lined by double layers of cuboidal or columnar epithelium. Many ducts were dilated, and practically all contained a granular mucoid precipitate (Fig. 8). Glandular spaces lined by large eosinophilic epithelial cells were numerous. In these the epithelium was hyperplastic and formed papillary, ingrowths nearly filling the lumina. The pathologic diagnosis was granulosa-cell tumor, trabecular type, of the left ovary; adenocarcinoma, corpus uteri; and hyperplasia of the mammary glands.

The specimen of the following case was presented to the Department of Pathology of the University of Colorado, by L. E. Likes, M.D., of Lamar, Colo.:



Fig. 8.—Section of mammary gland showing duct epithelial hyperplasia ($\times 100$).

CASE 3.—M. P. 5062, white woman, aged 62, menstrual history unimportant, menopause at 45 years. The present history dates back three years, when spotting occurred to appear again one year later. Eleven months later bleeding occurred with small amounts up to the time of operation.

Pelvic examination revealed the cervix smooth, healthy and very firm. The uterus was about the size of a two-month pregnancy. Treatment consisted of radium application followed by hysterectomy.

The pathologic specimen consisted of the uterus with both ovaries and the right Fallopian tube. It had been fixed in formaldehyde solution. The uterine cavity had been partially opened and a mass of endometrium protruded through the opening. The uterus was globular and approximately 6 cm. in diameter. Cut surfaces showed a solid endometrial mass filling the uterine cavity, and apparently invading the myometrium to a depth of 1 cm. in several areas. The left ovary measured 2.7 by 1.7 by 0.9 cm. in size and appeared completely atrophic.

The Fallopian tube was not remarkable. The right ovary was enlarged, measured about 3 cm. in diameter, and contained a lobular, yellowish, solid tumor. (Fig. 9.)

Microscopically, the right ovary is found to contain an encapsulated tumor composed of spindle cells of fairly uniform size with fibrous strands of varying density and numerous small blood vessels (Fig. 10).



Fig. 9.—Portion of uterus showing endometrial overgrowth and attached theca-cell tumor of the ovary.

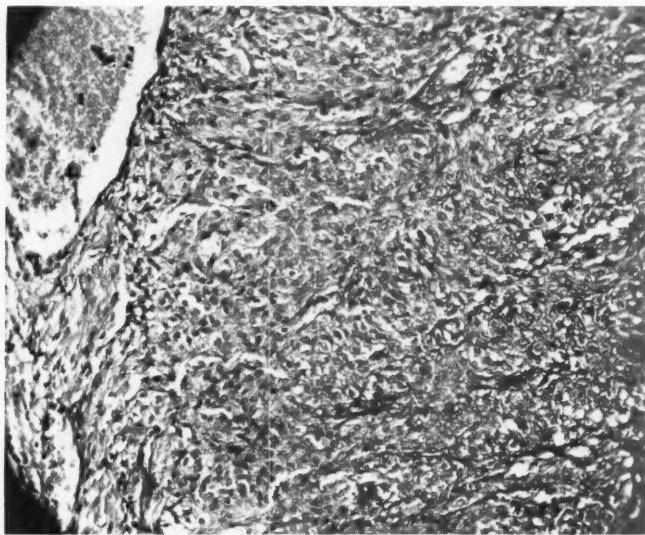


Fig. 10.—Theca-cell tumor of the ovary ($\times 170$).

Frozen sections stained with sudan III showed the presence of many small globules of fat or lipoid in the cytoplasm of the spindle cells and free in the interstices. No follicular structures or cysts were present.

Sections of the uterus showed a complete conversion of the endometrium into a papillary and glandular mass of atypical columnar epithelium supported by delicate connective tissue cords. The nuclei

were basal, with frequent mitotic figures. The cytoplasmic staining was variable, with groups of clear cells. Mucin production was scanty in some areas, abundant in others. The myometrium was invaded by groups of epithelial cells in glandular formations (Fig. 11). The pathologic diagnosis was adenocarcinoma of the endometrium with invasion of the myometrium and theca-cell tumor of the right ovary.

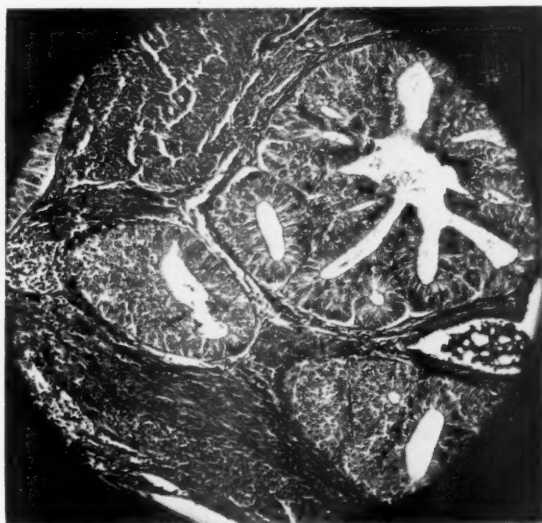


Fig. 11.—Section of uterus showing adenocarcinoma of the endometrium with myometrial invasion ($\times 100$).

Discussion

In each of these cases the histologic appearance of the endometrium is sufficiently hyperplastic and atypical to be classed as adenocarcinoma.

A search for definitions as to what constitutes carcinoma of the body of the uterus yields only equivocal criteria. Both Ewing¹¹ and Novak¹² follow the precepts of Ruge and Veit in dividing corpus carcinomas into circumscribed and diffuse growths. Ewing states that the cervical canal is rarely involved in corpus carcinoma, and that the integrity of the myometrium is the chief factor in the favorable prognosis of many uterine cancers. Also, according to Ewing, the muscular wall may become thin while still free from invasion.

Proof of malignancy would be furnished by perforation of the thinned-out wall with peritoneal extension; true infiltration of the myometrium by tumor cells; lymphatic or blood vascular extension and metastasis.

In Novak's opinion, although invasiveness is looked upon as the most decisive feature of cancer, the absence of stromal invasion by the epithelium should not influence the diagnosis when other characteristic features are present.

Thus, there can be no strict limitation of the definition of corpus carcinoma from the histologic point of view unless some or all of the

above-mentioned features are insisted upon, and these are to be expected only in late cases.

Practically, accurate diagnosis of corpus carcinoma is made from curettage specimens in which myometrium is lacking. In such cases invasiveness can only be estimated, and the extent of the growth cannot be determined.

Endometrial hyperplasia which duplicates the histologic features of adenocarcinoma of the uterine body may accompany granulosa-cell tumors of the ovary. In our Case 1, the endocervix also is hyperplastic. There is no histologic criterion which enables us to distinguish this condition from adenocarcinoma, yet in one of Stohr's cases, that of a woman before the menopause, a normal menstrual cycle was resumed 6 weeks following the removal of the granulosa-cell tumor. Curettage after 8 weeks showed a typical early secretory phase of the endometrium, and the patient remained well with a normal menstrual history for five years.

This case of Stohr's is remarkable in that only the ovarian tumor was removed. The estrogenic influence of the remaining ovary was not abolished and yet the endometrial hyperplasia regressed. This case provides evidence of the direct relationship between the ovarian tumor and the endometrial hyperplasia, considered by Stohr as adenocarcinoma, and in addition, indicates that such proliferation is reversible.

It remains a question as to whether or not a true carcinoma of the endometrium would regress if all abnormal sources of estrogenic hormones could be removed.

According to Taylor, three sources of an excessive supply or abnormal type of estrogenic hormone in the human may be considered: from follicles, as in follicular (functional) cysts; from ovarian tumors, as in granulosa-cell and theca-cell tumors; and from an extraovarian source.

In the third instance, the presence of estrogenic substances in male urine and in the urine of females after the menopause and after castration may be cited.

As has been suggested, extraovarian estrogenic substances may be formed in both sexes in the metabolism of cholesterol and bile acids, and chemically related carcinogenic substances may likewise originate in the same manner.

From the report of Jones and Brewer,¹⁰ it appears that normally functioning ovaries do not prevent the development of endometrial carcinoma, and that hyperestrinism or the unopposed action of estrin is not responsible for such development. It is possible that all endometrial carcinomas do not have the same cause or causes.

A further search for etiologic factors within the ovary may still be indicated, however, because of (1) the apparent infrequency of endometrial carcinoma in surgical castrates, (2) the frequency with which

endometrial carcinoma and granulosa- and theca-cell ovarian tumors are associated, and (3) the spontaneous regression of an "adenoma malignum" type of endometrial hyperplasia following removal of a granulosa-cell tumor of the ovary, in Stohr's Case 2.

Conclusion

Two additional cases of granulosa-cell tumor and one of theca-cell tumor of the ovary associated with adenocarcinoma of the corpus uteri are reported. The role of the ovaries in carcinoma of the uterus is discussed. The question of definition of cancer of the corpus uteri is reviewed.

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Discussion

DR. JEAN PAUL PRATT, Detroit, Mich.—Having had the opportunity of reviewing the prepared sections that Dr. Ingraham kindly sent me, I find the diagnosis of adenocarcinoma of the uterus and hyperplasia of the endometrium can readily be accepted. Furthermore, the diagnosis of granulosa-cell tumors of the ovaries is obvious from the appearance of the sections. The clinical history is typical of adenocarcinoma of the uterus for, in each case, the uterus was enlarged and bleeding appeared in women well past the menopause.

To present 3 cases in which adenocarcinoma of the uterus is associated with granulosa-cell tumor of the ovary is an unique experience. I have just reviewed 135 cases of adenocarcinoma of the uterus, and none of them were associated with functioning tumors of the ovary. On the other hand, 5 cases of granulosa-cell tumor of the ovary were not associated with adenocarcinoma of the uterus.

Presentation of the three cases naturally raises the question of carcinogenesis. Since Leo Loeb, 25 years ago, predicated a hormonal etiology of cancer of the mammary gland, a vast array of evidence regarding his theory has been presented. Investigations were soon extended to other organs including the uterus, but the results have been less conspicuous. Among the early investigators in this field, Edgar Allen employed large doses of estrogens administered to monkeys over a long period of time. Considerable hypertrophy of the cervix resulted, but even with the addition of trauma no cancer developed. Other experimenters have been no more successful in producing cancer of the cervix. Experimental study of cancer of the uterus has been limited because no species of animal has been found which possesses a strong hereditary susceptibility to cancer of the uterus.

Inferences from animal experiments are valuable indicators for procedure in clinical investigation. The extreme variations of susceptibility to cancer in different species and strains emphasize the importance of heredity. The relative speed with which experiments in hereditary in animals can be concluded tends to discourage similar studies in man whose life span by comparison is so much longer. A sufficient number of family histories has been recorded to show that certain types of cancer are strongly hereditary while other types show no hereditary tendencies. Of particular significance in this connection is the record of twins. In 50 per cent of those who had cancer, the other twin developed cancer at the same site and at approximately the same age. Could Dr. Ingraham give us any further family history in his cases?

The majority of cancers of the uterus occur after the menopause. If one assumes hormonal influence as important in the incidence of cancer of the uterus, would he not expect the growth to appear before the menopause?

The extensive use of estrogens affords another opportunity for clinical investigation of carcinogenesis. There are now many cases on record and many more not recorded in which enormous doses of estrogens have been given over a long period of time, but no carcinomas developed. Adding the greater incidence of cancer after the menopause to the extensive use of estrogens without inducing cancer speaks against the ovarian hormones as carcinogenetic agents in cancer of the uterus.

Is the growth of cancer due to inciting certain cells to growth or to release of inhibitors in the environment, or both? The cause of cancer remains a very complex problem. The final solution rests with further clinical observations and interpretations. Dr. Ingraham's contribution invites further observation on the uterine ovarian relationship.

DR. GRETE STOHR, New York City, by invitation.—Dr. Stohr presented lantern slides of three cases observed in the Woman's Hospital, in which a coincidence of granulosa-cell tumors and endometrial cancer was also noted.

Case 1 showed the uterus and appendages of a patient 64 years of age. The endometrium exhibited partial glandular hyperplasia and partial malignant degeneration of a mature type. The ovary contained a granulosa-cell tumor of massive form, composed of highly typical granulosa cells. This patient remained well during nine years of observation.

In Case 2, the slides were from curettings and an ovarian tumor of large size obtained from a 41-year-old patient. The curettings showed partly glandular hyperplasia and partly atypical proliferation with malignant characteristics. Some fragments were also present of a squamous cell mucosa presenting hyperproliferative excessive epidermization. The ovarian tumor was of the granulosa-cell variety, largely of massive type, partly of trabecular form.

Assuming the correlation between the neoplastic overgrowth of the endometrium and the ovarian tumor no radiotherapy was given. The reversibility of the endometrial changes was demonstrated by a microscopic slide of curettings obtained 6 weeks after the primary operation, which presented a normally built secretory mucosa. After this operation the menses continued in an entirely normal fashion.

In Case 3 the slides presented curettings of a patient 60 years of age with postmenopausal bleeding, showing partly glandular hyperplasia and partly papillary adenocarcinoma of marked maturity. The neoplastic tissue was particularly characterized by large plaques of squamous epithelial cells and cells in transition from the columnar to the squamous cell form. This case was first curetted, radiation therapy given and then 6 weeks later as a routine measure, complete hysterectomy and bilateral salpingo-oophorectomy were performed. The microscopic slides of the operative specimen present an ovarian tumor 3 cm. in diameter, a typical granulosa-cell tumor of mature follicular type.

In reviewing these three cases one may arrive at the theory that a direct correlation exists between the maturity of the granulosa-cell tumor and the carcinogenic effect. While the immature form of the granulosa-cell tumor (first two cases) exerted less carcinogenic activity, the mature follicular form (third case) produced the more pronounced and immature form of endometrial carcinoma.

DR. EMIL NOVAK, Baltimore, Md.—We also have encountered a number of cases in which adenocarcinoma of the uterus has been found in association with granulosa- or theca-cell tumors of the ovary, but I shall not stop to detail them here. When such an association is found, one must think of the so-called combined types of cancer, in which two different varieties of cancer are found in one or more organs. It is unlikely that this factor of coincidental coexistence applies to the group of cases illustrated by those just reported by Dr. Ingraham. It is significant that while a considerable group of this variety has been observed, granulosa-cell carcinoma has also been reported with carcinoma of the breast, but not with cancer in other organs. This would seem to bear out the generalization laid down many years ago by Loeb, to the effect that estrogen may play some role in the development of cancer, but only of those organs and tissues which are normally under the physiologic control of estrogen.

It should be remembered that granulosa-cell carcinoma of the ovary rather characteristically provokes a hyperplasia of the endometrium, and that in some cases of the latter, a proliferative picture may be found which could be mistaken for cancer, although it is perfectly benign. Indeed, I would be inclined to interpret in this way one or two of the slides which Dr. Stohr has thrown on the screen as adenocarcinoma, although I appreciate the hazard of microscopic diagnosis from a single lantern slide.

Some years ago Taylor and his associates, and shortly afterward Yui and I, published studies to emphasize the relatively frequent association of postmenopausal hyperplasia and adenocarcinoma of the uterus. I still feel that this finding is of significance, and that the subjection of the postmenopausal endometrium to estrogenic stimulation may play at least a predisposing role in the development of cancer.

DR. INGRAHAM (closing).—We do not mean to be too dogmatic in saying whether these cases were carcinomas or hyperplasias, but I think from histologic specimens it would be impossible to say that they were not endometrial carcinomas.

Dr. Frank Pemberton, who was to discuss this paper, said they had had at the Free Clinic for Women, in Boston, seven cases of a combination of ovarian tumor with adenocarcinoma of the corpus uteri. In one case the accompanying ovarian neoplasm was a granulosa-cell tumor; in five a theca-cell tumor and in one a luteoma. I think that perhaps this is a more common association than we perhaps realize. We feel that the condition is secondary to the theelin stimulation accompanying the granulosa-cell tumor.

THE MINIMAL HISTOLOGICAL CHANGES IN BIOPSIES TO JUSTIFY A DIAGNOSIS OF CERVICAL CANCER*

RICHARD W. TELINDE, M.D., AND GERALD GALVIN, M.D.,
BALTIMORE, MD.

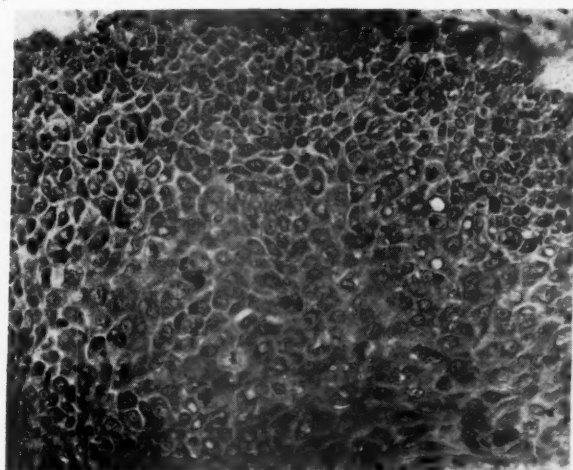
(From the Gynecological Department of the Johns Hopkins University and Hospital)

THE minimal histological epithelial change in the cervix required to justify a diagnosis of carcinoma presents a problem about which there is still considerable controversy among gynecological pathologists. The inability of pathologists to diagnose with certainty extremely early lesions has resulted in many mistakes of a serious nature. Errors are made in both directions. Benign cancerlike lesions, the result of squamous cell metaplasia and epidermidization are frequently erroneously called malignant. Early malignant lesions are also not infrequently erroneously considered benign. Often, when dealing with these cancerlike lesions, the pathologist is in doubt, and he attempts to mask his lack of knowledge by calling them "precancerous." This results in unnecessary surgery or irradiation. It is not, however, with these cancerlike lesions that we are concerned in this paper. For a consideration of them, the reader is referred to articles by Novak,¹ Meyer,² and TeLinde.³ In this study, we have interested ourselves in the extremely early malignant lesions which are not infrequently called benign at a time when they could be cured by surgery or by irradiation. In the present study, we have attempted to call attention to the earliest histological changes found in biopsies which have, in these cases, constituted the warning signal which has led us to the ultimate diagnosis of cancer.

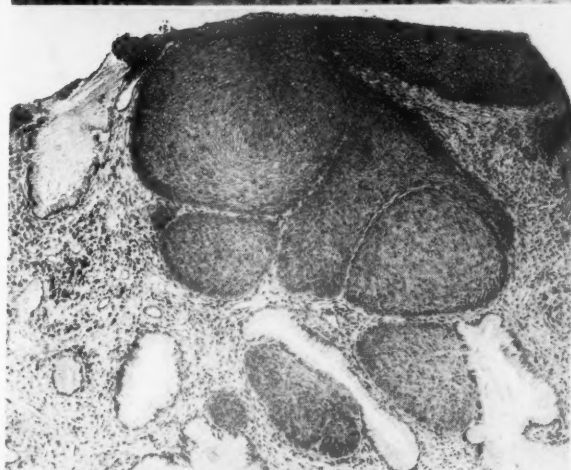
One or more biopsies were taken from all of the cervixes of this series. In approximately half of the cases, several well-trained gynecological pathologists were unwilling to make the diagnosis of cancer from the changes noted in the biopsy specimens. We, too, confess that there was doubt in our minds as to the true malignant nature of some of the biopsy specimens, but since in many of the cases hysterectomy was indicated because of fibroids or functional bleeding, it was easy to make the decision to perform a total hysterectomy. In all instances the entire cervix was cut into blocks, and in many cases much careful searching had to be done before an area of actual invasion was found. A correlation of the biopsy findings with the ultimate histopathological findings in the removed cervixes was made.

In ten of the series of eleven cases to be presented here, we found, after removal of the cervixes, absolute histological evidence of invasive car-

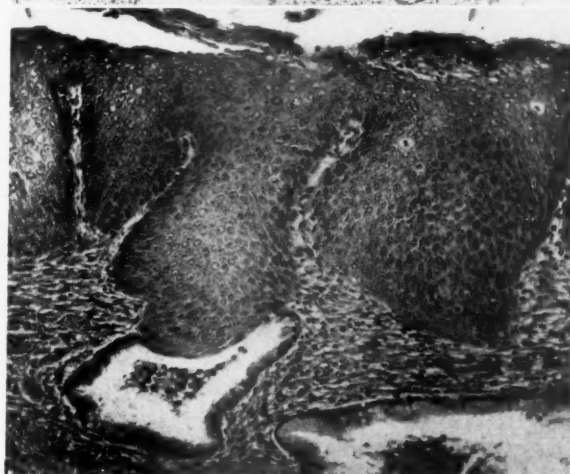
*Read at the Sixty-Eighth Annual Meeting of the American Gynecological Society, Hershey, Pa., June 19 to 21, 1944.



A.



B.



C.

Fig. 1.—See page 776 for case history legend.

cinoma. In the eleventh case, the only area of invasion was found in a biopsy specimen, but the removed cervix showed extensive changes in the surface epithelium such as were seen in the biopsies of the other cases. The results of the study have been illuminating to us and, we believe, should prove of value in interpreting future biopsy specimens.

We are presenting below brief résumés of the clinical and pathological facts concerning these eleven cases. In none of these women was a diagnosis of cancer possible from palpation or inspection of the cervix. In only one instance was any ulceration seen. The biopsies were taken because of slight suspicion on inspection of the cervix, because of a history of intermenstrual spotting, with or without a suspicious-looking cervix, and, in a few instances, as a matter of "routine" when curettage was done. In one instance, the lesion was discovered accidentally in the routine histological examination of a normal-appearing cervix which was removed in the course of a Manchester operation for prolapse.

Discussion

From a study of this material we have concluded that the abnormal cellular activity which eventually results in fully developed cancer begins in the basal cells of the surface epithelium. In the normal cervical epithelium there is a single layer of fat spindle cells forming the basal layer. They stain deeply with hematoxylin. (Fig. 12, *C*.) The transition from this normal picture to extreme basal-cell hyperactivity involving the full thickness of the surface epithelium may be shown histologically

Fig. 1.

CASE 1.—History No. 170,677. Path. No. 48793; 49,533 and 49,633. Aged 30 years. Para 0. Complaint: Intermenstrual bleeding.

Biopsy taken on July 12, 1939, because of granular appearance of cervix. Section (Fig. 1*A*) showed marked basal-cell hyperactivity of the surface epithelium with many mitotic figures. No invasion. Patient observed. Second biopsy (Fig. 1*B*) taken on November 30, 1939, because of postcoital spotting, showed complete loss of stratification of surface epithelium and definite invasion of cervical stroma by histologically similar epithelium. Definite diagnosis of carcinoma was made and total hysterectomy done on December 22, 1939. Entire cervix cut in blocks and sectioned. Only beginning invasion was found at one point (*C*), but surface epithelium showed extensive change as in first biopsy. Apparently only area of unquestionable invasive carcinoma was excised at second biopsy (*B*).

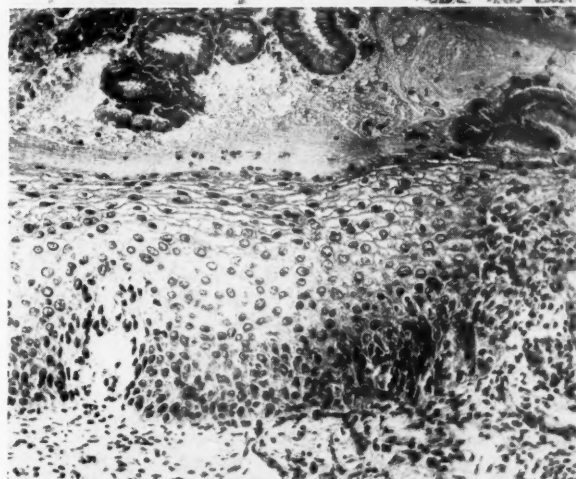
Fig. 2.

CASE 2.—History No. 152,017. Path. No. 52,721; 52,751 and 52,820. Aged 28 years. Para 0. Complaint: Profuse and prolonged menses for 6 months.

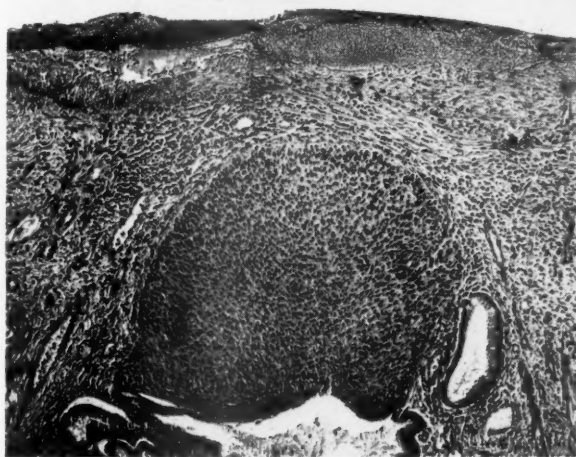
No intermenstrual bleeding. Leucoplakic area on cervix biopsied on June 11, 1941 (Fig. 2*A*), showing small piece of epithelium with complete loss of stratification. Because of plane of section and inflammation, it was difficult to orient section. Second biopsy taken on June 16, 1941 (*B*), showed only basal-cell hyperactivity; no invasion. Total hysterectomy, left salpingo-oophorectomy done on June 25, 1941. Total cervix sectioned revealing definite invasive carcinoma with partial destruction of gland (*C*).



A.



B.



C.

Fig. 2.—See opposite page for case history legend.

in a variety of ways. The normal and hyperactive epithelium may be demarcated by the often-described short oblique line of Schiller. We have observed more often, however, a gradual transition from slight overactivity to a complete involvement of the full thickness of the epithelium by hyperactive epithelial cells. Figs. 12, *A* and *B* show this overactivity. At the left of section *A*, the full thickness of the epithelium is taken over by the hyperactive basal cells. In some instances, as one follows the increase in basal-cell proliferation along the surface epithelium, a long sharp oblique line may be seen demarcating the hyperactive basal epithelium from the upper normal epithelium. (Fig. 3 *C*.) On the other hand, we have rarely observed an absolutely abrupt change indicated by a perpendicular line as shown in Fig. 13. Regardless of the manner of transition, when the full thickness of the epithelium is made up of this hyperactive basal epithelium, the ultimate picture is the same. There is a complete loss of the normal stratification of the cells; the cells and especially the nuclei are irregular in size and shape, and a variable number of mitotic figures are present.

It would seem from our observations in tracing these surface changes that after the hyperactive basal epithelium has taken over the full thickness of the epithelium, the next step is invasion of the subepithelial tissue. So frequently have we traced this succession of histological changes that there is a strong suggestion that this is actually the succession of events. The glands seem to afford a favorite route for invasion of the underlying tissue. The columnar epithelium lining the gland is destroyed as the epithelium advances. When the base of the gland is reached, the malignant epithelium continues its growth into the depth of the tissue. There is a distinct difference between this process and that seen when the columnar lining of a gland is replaced by the benign process of epidermidization. Aside from the difference in character of the individual cells taking part in invading the gland, there is the difference that when the lumen of the gland is filled in its length and breadth by the epidermidization process the growth ceases, whereas the malignant growth continues into the adjacent tissue.

From our observations in the afore-mentioned eleven cases, there is the strong suggestion that all epidermoid cervical cancer arises in the basal-cell layer regardless of what cell type predominates ultimately in the fully developed cancer.

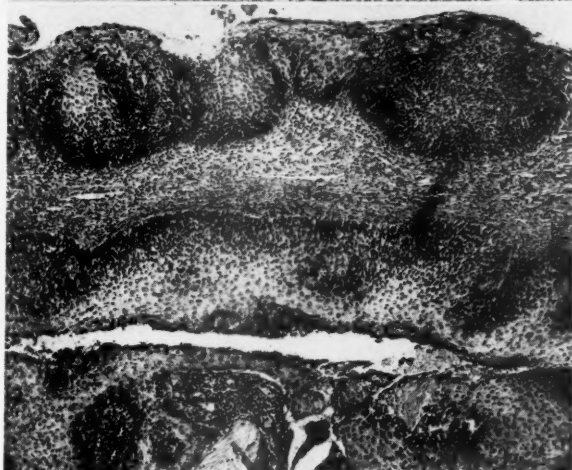
Fig. 3.

CASE 3.—History No. 96816-2 U.M. Path. No. 54,007; 54,048; 54,078 and 54,153. Aged 31 years. Para 0. Metrorrhagia January to May, 1941.

Spotty leucoplakia of cervix. Biopsy on January 13, 1941 (Fig. 3*A*), showed only marked basal-cell activity. Cervix amputated on January 26, 1942 (*B*), showed some hyperactive epithelium on surface and invading deep into subepithelial tissue. Section from surface of cervix elsewhere showed long oblique line demarcating various degrees of basal-cell hyperactivity from upper hornified layer (*C*). This is not the usual short oblique line described by Schiller.



A.



B



C.

Fig. 3.—See opposite page for case history legend.

The question of how long such surface epithelial changes can be present before actual invasion takes place, or indeed, whether such surface changes inevitably develop into true invasive cancer is of great

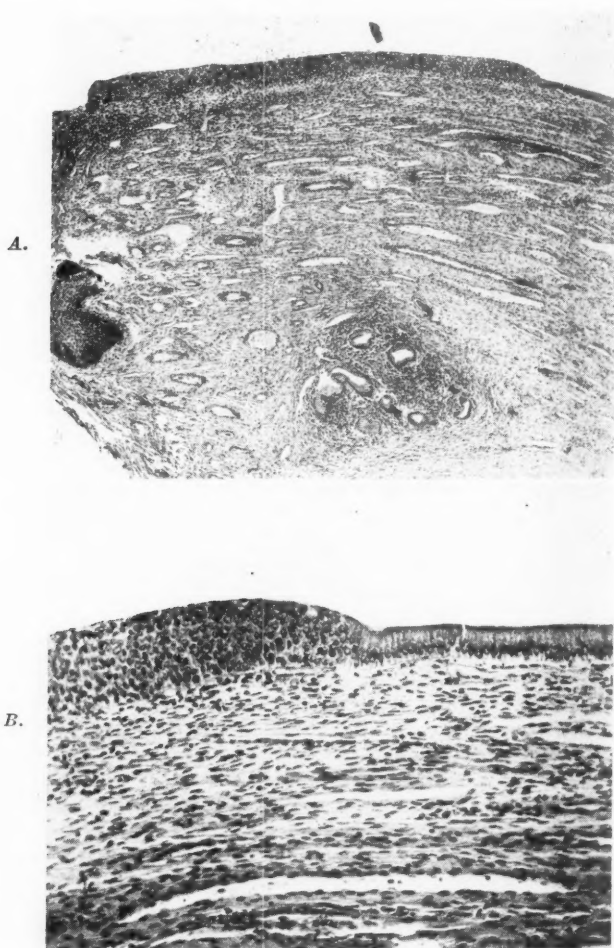
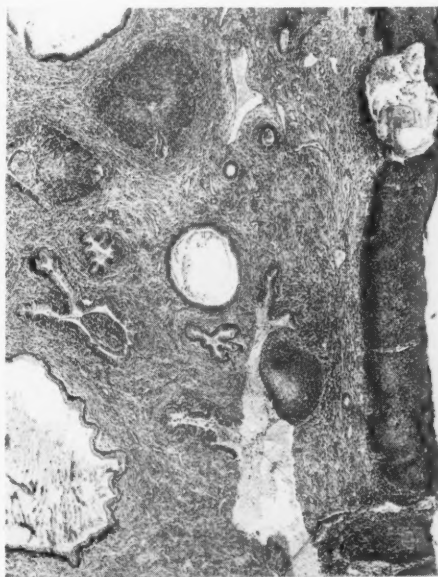


Fig. 4.

CASE 4.—History No.116,807. Path. No. 54,653; 54,688; 54,736; 54,809. Aged 31 years. Para 1-1. Metrorrhagia for one month.

Cervix very firm with hypertrophied anterior lip and small bleeding points near external os. First biopsy taken April 28, 1942 (Fig. 4A), showed complete loss of stratification at external os and a small bit of invasive epithelium of a similar character. High power of surface epithelium directly at junction of columnar and stratified epithelium (B). Subsequent biopsy taken on May 5, 1942, showed normal cervical tissue. A third biopsy taken May 14, 1942, showed surface epithelial change similar to that of first biopsy but with questionable invasion. On May 27, 1942, a total hysterectomy and double salpingo-oophorectomy were done. Sections of cervix (C and D) showed same surface changes and also definite invasion, destroying glands in depth of cervix.

scientific interest and clinical importance. It is interesting to note that the average age of these 11 cases of extremely early cancer is only 36 years, in contrast to an average age of 48 years for cancer of the cervix in general. This suggests, at least, the possibility of a surface lesion existing for years before the development of a gross carcinomatous lesion. We have, in our laboratory, two cases on record which cast some light upon this question. They have already been recorded in the literature by Stevenson and Scipiades.



C.



D.

Fig. 4.—See opposite page for case history legend.

C. P.—K 13414. Path. No. 25,171. Aged 28 years. Para 4-4. Trachelorrhaphy June, 1919. Routine examination of tissue removed showed noninvasive changes in surface epithelium similar to that seen in the present series. Speculum examination 2 years later showed cervix covered with normal-looking epithelium. Examination February, 1928, showed a large cauliflower-like carcinoma of cervix. Microscopic diagnosis: epidermoid carcinoma.

M. S.—Path. No. 49,900; 41,429 and 45,520. Aged 34 years. Complaint: dyspareunia. Routine speculum examination showed slight reddening about external os. Biopsies taken from that region on July 31, 1934, showed noninvasive carcinoma-like change in surface epithelium. Patient refused treatment. Second biopsy taken January 8, 1935. At this time cervix looked normal. Biopsy again showed some changes in the epithelial surface. Treatment refused. Death July 15, 1937, from pernicious anemia. Had no symptoms of carcinoma of cervix. Cervix removed after death showed extensive changes in surface epithelium similar to that noted in biopsies but invasion into stroma of cervix was seen at many points. No autopsy was obtained so further extension of carcinoma could not be determined.

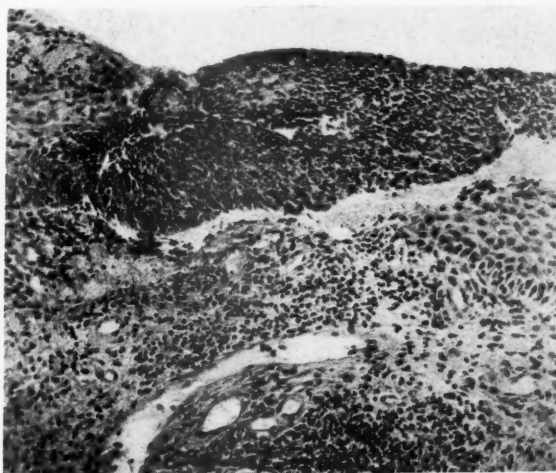
In the first of the above cases, we have a definite record of typical surface epithelial changes $8\frac{1}{2}$ years before the patient finally developed an extensive cauliflower-like cervical cancer. In the second case, the surface epithelial changes were known to have existed for three years before death from pernicious anemia. Up to that time no clinical evidence of carcinoma had developed, but the microscopic examination of the entire cervix showed undoubted invasive cancer. It cannot be stated how long the surface epithelial changes may exist before invasion begins, but the above two cases suggest the possibility of a duration for years. One cannot say with certainty whether invasion is eventually inevitable when such surface lesions exist. Since the two afore-mentioned cases illustrate that these lesions may exist for years before the development of clinical carcinoma, it is probable that in some cases death may take place from other causes before true invasive carcinoma develops.

In this connection it is important to know whether, after identifying the typical surface lesion, one is justified in proceeding with radical treatment in each case. In the past year, after finding these typical surface epithelial changes in biopsies, we have failed twice to find evidence of invasion on making a careful search in the removed cervix. Are we to regret these two hysterectomies as unnecessary operations? We believe not, in view of the findings in the foregoing reported eleven cases. Although we cannot say with absolute certainty that invasion would

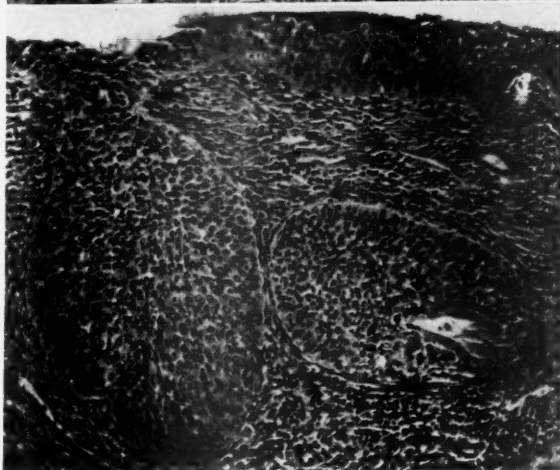
Fig. 5.

CASE 5.—History No. 254,539. Path. No. 54,437; 55,479; 55,494. Aged 30 years. Para 7-7. Menorrhagia since January, 1942.

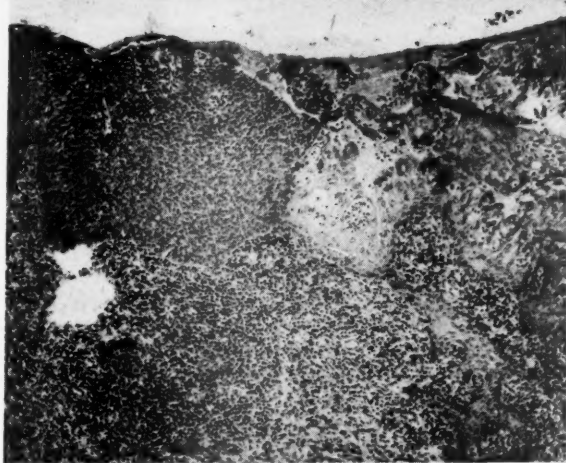
Dilatation and curettage September 16, 1942; curettings showed endometrial hyperplasia. Cervix showed a little roughening about external os and that area was biopsied at time of dilatation and curettage. Biopsy (Fig. 4A) showed complete loss of stratification in one small area. Total hysterectomy was done because patient was a severe functional bleeder. Sections (B and C) from cervix show undoubted invasive carcinoma. Section (C) shows marked contrast between early cancer on the left and epidermidization on the right.



A.



B.



C.

Fig. 5.—See opposite page for case history legend.

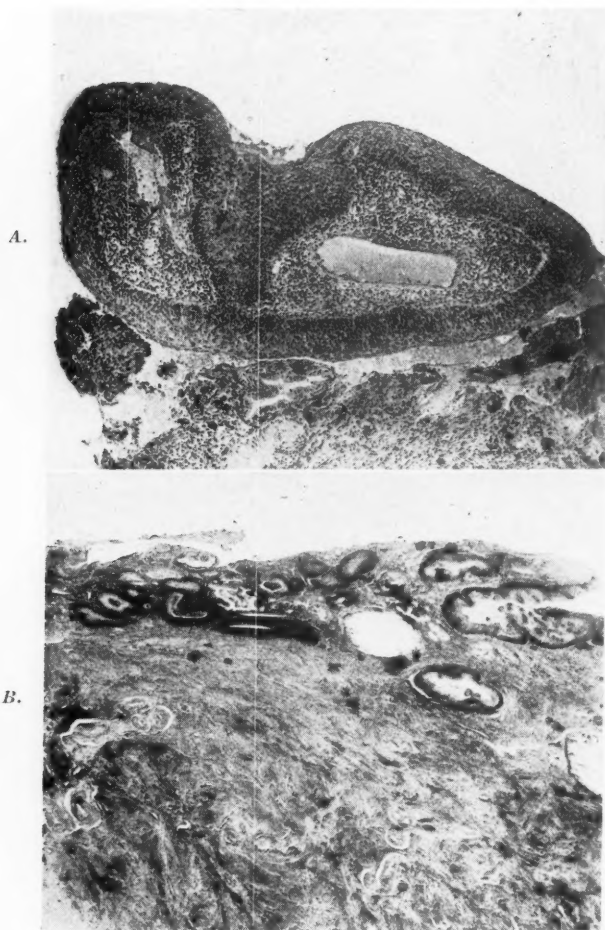


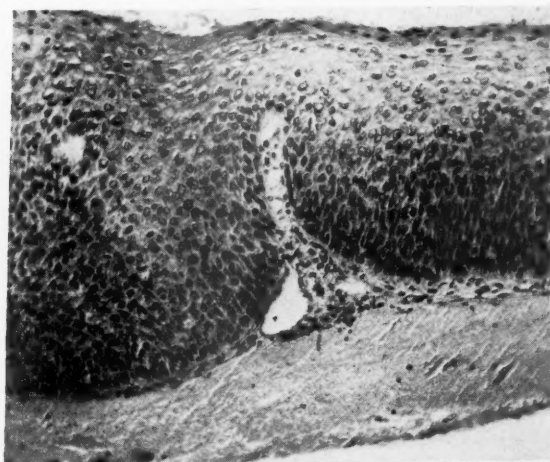
Fig. 6.

CASE 6.—History No. 156,130. Path. No. 55,853; 55,869. Aged 39 years. Para 6-4. Postcoital spotting for two to three months; profuse bleeding 3 days.

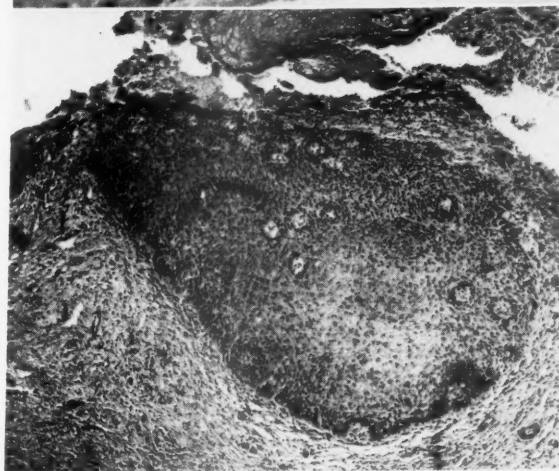
Myomatous uterus; soft granular cervix about external os. Biopsy of cervix taken November 16, 1942 (Fig. 6A), showed only surface epithelium with complete loss of stratification. Total hysterectomy November 18, 1942. Cervix showed definite invasive carcinoma. Many tongues of invasive carcinoma are shown under low power in B.

CASE 7.—History No. 277,430. Path. No. 55,695; 55,811; 55,890 and 55,947. Aged 39 years. Para 6-4. Complaint: Profuse menses for one month. No intermenstrual bleeding.

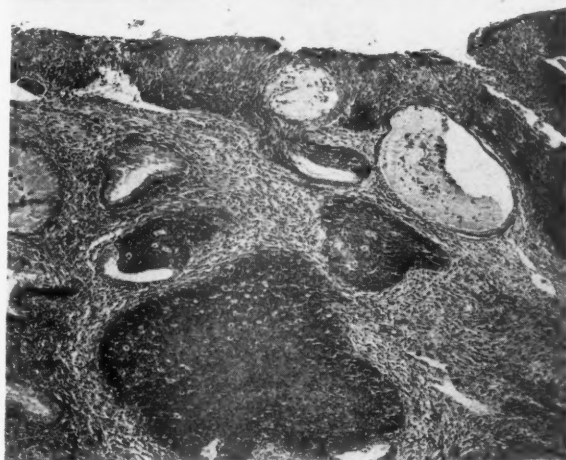
Myomas present. Cervix firm, lacerated with irregular, hypertrophied anterior lip and granular posterior lip. Biopsy taken October 20, 1942 (Fig. 7A), showed marked basal-cell hyperactivity but no invasion. Biopsy taken one month later (B) showed a tangential section through hyperactive basal epithelium. Section from cervix, removed by total hysterectomy December 3, 1942, showed definite invasive carcinoma (C).



A.



B.



C.

Fig. 7.—See opposite page for case history legend.

have eventually resulted in these two cases, we believe that there is a strong likelihood, and regard the surgery as justifiable prophylaxis. It is our considered opinion that when basal-cell hyperactivity is of such a degree as to involve the full thickness of the epithelium, replacing the normal stratified epithelium, hysterectomy is indicated. Since all degrees of basal-cell hyperactivity are encountered, there will be inevitably some instances in which there will be doubt as to the proper procedure. A good working rule in cases in which the hyperactivity is of a questionable degree is never to lose sight of such a patient, but to biopsy and re-biopsy at intervals of a month or two until one is quite satisfied that he is or is not dealing with early malignancy. The question can usually be answered quite definitely within a few months.

From a review of these cases, it becomes obvious that the diagnosis of early cervical cancer has become a matter of appreciation of the finest and earliest changes in the epithelium. In our present state of knowledge, we do not know enough about these early changes to be dogmatic concerning the exact degree of epithelial change necessary to justify a diagnosis of cancer, but in this report we have recorded eleven cases in which the change in the surface epithelium was sufficient to cause us seriously to suspect carcinoma. Unquestionable cancer was found on complete section of the cervix in ten cases. In the eleventh, invasive carcinoma was seen in one biopsy section. These cases stress the importance of biopsy and often repeated biopsy of cervixes of which one is suspicious either on the basis of the history of spotting and/or the appearance of the cervix. These cases also stress the fact that the most vulnerable spot for the beginning of cervical cancer is the external os, or more exactly, at the junction of the squamous and columnar epithelium.

In some instances in which the history of spotting causes one to be suspicious, and yet when the appearance of the cervix gives no clear-cut indication of where the biopsy should be taken, tissue had best be excised at the external os. In one of the foregoing cases, the first biopsy was only suspicious; a second biopsy was taken by doing a conization and completely sectioning the cone of tissue. Although we have not used conization extensively, because most of these biopsies were taken in the outpatient department, we believe that the procedure has merit at times, as a means of getting a complete biopsy of the vulnerable area.

Fig. 8.

CASE 8.—History No. 186,402. Path. No. 56,070; 56,081; 56,111. Aged 41 years. Para 8-7. Postcoital bleeding for 19 months.

Cervix hypertrophied with diffuse red and granular appearance of the posterior lip which bled easily on touch. Biopsy taken December 30, 1942 (Fig. 8A), showed only marked changes in surface epithelium; no invasion. Second biopsy taken December 31, 1942, showed similar changes. Total hysterectomy on January 6, 1943. Cervix showed same surface epithelial changes but also early invasive carcinoma (B and C).



Fig. 8.—See opposite page for case history legend.

Because the changes are histologically of the finest type, we believe that the best possible sections should be utilized for study. For this reason, we never use quick-frozen sections in searching for these finer changes. In slightly over 24 hours an excellent paraffin-embedded and well-stained section can be made, and this slight delay is of no importance. It has never been shown that the lapse of a short interval of a few days between the time of the biopsy and subsequent treatment affects the prognosis adversely in cervical cancer.

The astonishing thing to us in making this study is the frequency with which these lesions have occurred in our laboratory. Eight of these eleven cases were found within a twelve-month period. During this time, 704 cervical biopsies were made. This incidence is much greater than has ever occurred in our laboratory during any corresponding period of time. The question arises whether such lesions have mistakenly been considered benign in former years. We believe that some errors have been made in this way, but probably the greatest factor in our increased finding of these lesions has been the great increase in the number of biopsies taken in our outpatient department and by our attending gynecologists in their private practice.

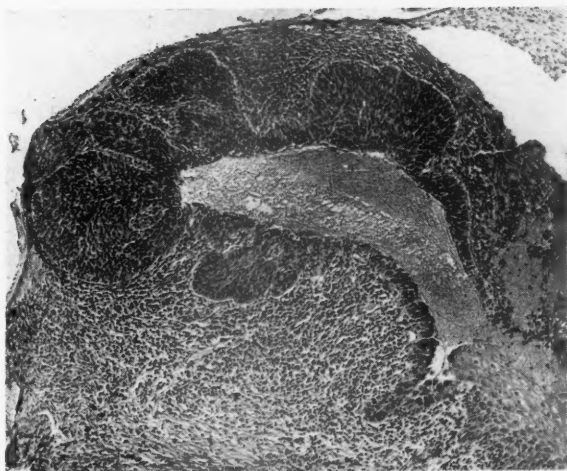
This paper was prepared for presentation before this Society at last year's meeting which was, as you all know, cancelled. We continued with this work during the intervening year and have discovered by biopsy five more cases which fall into the same category. This brings the total number of cases here reported to 16. In order not to lengthen the paper unduly, we have not reported the additional cases in detail or shown more photomicrographs.

The frequency with which we have encountered these lesions naturally has a direct bearing upon the choice between total and subtotal hysterectomy. Many factors beside the condition of the cervix enter into the decision in each case, such as the obesity of the patient, the general medical condition of the patient, the presence or absence of pelvic inflammatory disease, and the difficulties encountered at operation, but it is not within the scope of this paper to discuss this subject fully. We do wish, however, to put these data on record so that they may be evaluated in relation to the subject of total versus subtotal hysterectomy. The finding of 8 definitely cancerous lesions in normal or almost normal-looking cervixes in one year in a clinic in which 429 hysterectomies were done within the same period of time causes one to lean more toward total

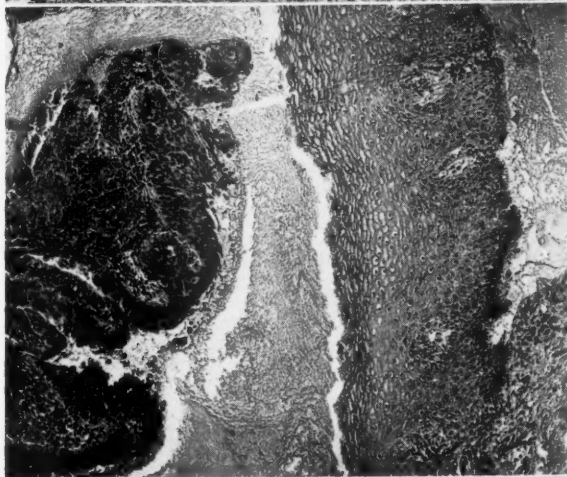
Fig. 9.

CASE 9.—History No. 111,516. Path. No. 55,914; 56,108; 56,204; 56,257. Aged 33 years. Para 2-2. Postcoital spotting for 2 weeks.

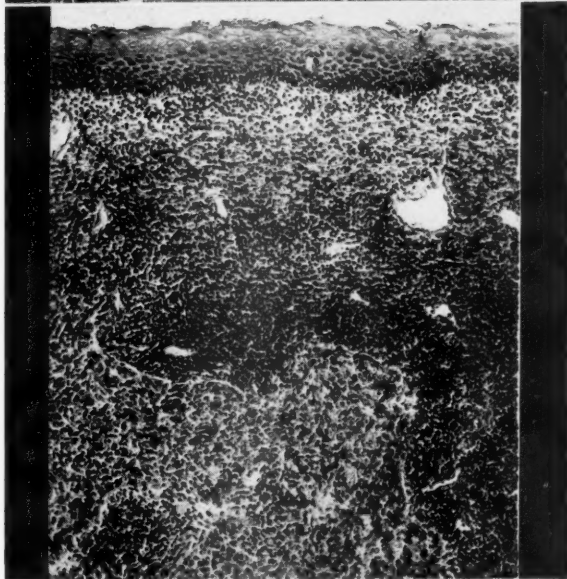
Cervix "large with shallow bleeding ulcer at 5 o'clock, the size of a small finger-nail." Biopsy January 6, 1943 (Fig. 9A), showed complete loss of stratification and malignant change in cells but no invasion. Another biopsy January 20, 1943 (B), showed similar surface epithelial changes. Hysterectomy January 27, 1943. Cervix showed undoubted deep-lying carcinomatous tissue (C). This is the only case in which the carcinoma actually lay in the portio away from the external os and undermined normal mucosa.



A.



B.



C.

Fig. 9.—See opposite page for case history legend.

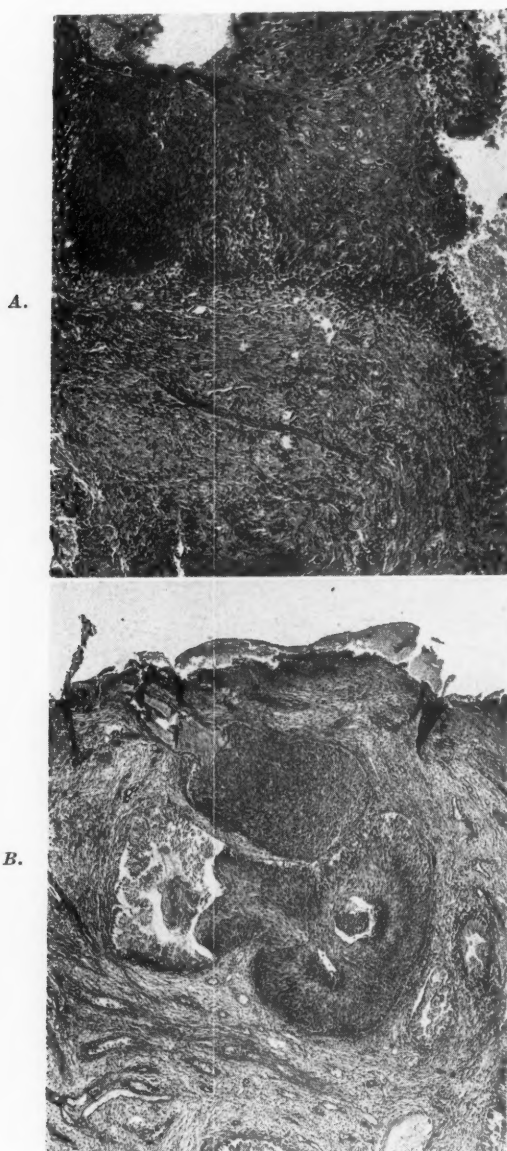


Fig. 10.

CASE 10.—History No. 160,962. Path. No. 56,470; 56,583; 56,603. Aged 39 years. Para 2-0. Complained on March 15, 1943, of amenorrhea since November.

Leucoplakic area seen on cervix. Biopsy showed suspicious areas in surface epithelium (Fig. 10A). On March 16, 1943, conization of cervix was done. Cervical tissue removed, cut up entirely in several blocks, and further surface epithelial change seen as well as definite invasive carcinoma (B). Subsequent total abdominal hysterectomy was done. The remainder of cervix thus removed failed to show any more carcinoma.

hysterectomy. During the past several months, we have completely cut into blocks all the cervixes removed by total hysterectomy and cut many sections from each block. We now have carried out this laboratory procedure in 240 instances. Among these, we have encountered microscopic extremely early invasive carcinoma in two instances. Often it was necessary to cut a great many sections before the area of invasion was found. In every one of these cases we had satisfied ourselves by history, cervical inspection and/or biopsy that cancer did not exist before operation and yet the removed cervixes showed cancer in 1.3 per

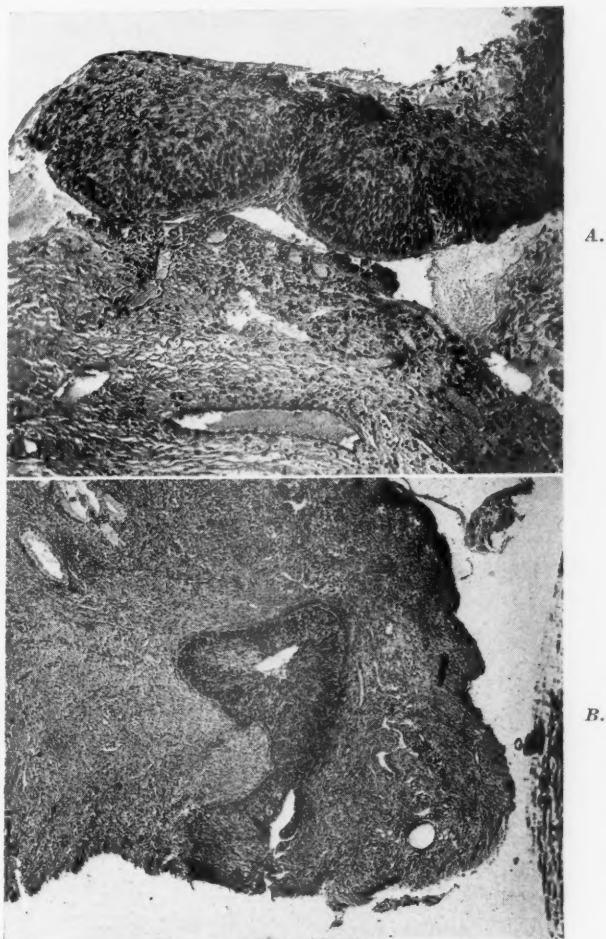
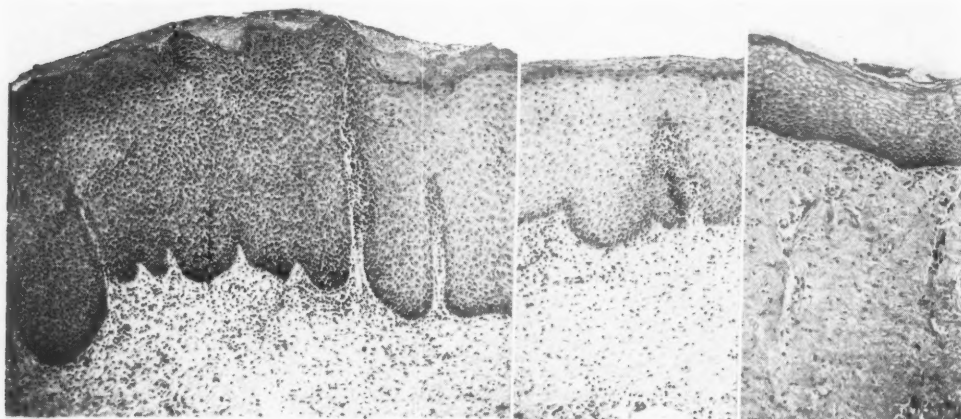


Fig. 11.

CASE 11.—History No. 285,228. Path. No. 56,452. Aged 49 years. Para 2-2. Complaint: On July 24, 1941, complained of heavy sensation in pelvis.

Pelvic examination showed cystocele, rectocele and descensus of uterus, almost second degree. February 25, 1943, Manchester parametrial fixation done. Cervix not suspicious of malignancy. On routine examination of cervix in laboratory, intra-epithelial changes were noted in surface epithelium (Fig. 11A). Entire cervix was then cut in blocks and sectioned. Invasive carcinoma was found (B). Patient was treated with irradiation.

cent. This finding of even an occasional cancer in normal-looking, asymptomatic cervixes, some of which were biopsied, is rather startling. It undoubtedly indicates the desirability of getting rid of the cervix, but it does not dictate the policy of routine total hysterectomy in complete disregard of the other factors mentioned above. Certainly, it behooves the gynecologist who performs subtotal hysterectomy frequently, to biopsy freely all cervixes on the slightest suspicion.



A.

Fig. 12.

B.

C.

CASE 11.—A. Normal cervical epithelium, with single layer of fat spindle cells at base.

B. Increased basal-cell proliferation.

C. Still more marked basal-cell proliferation. As one progresses from right to left, the basal-cell hyperactivity increases until finally the full thickness of the surface epithelium is taken over by the overactive basal cells.

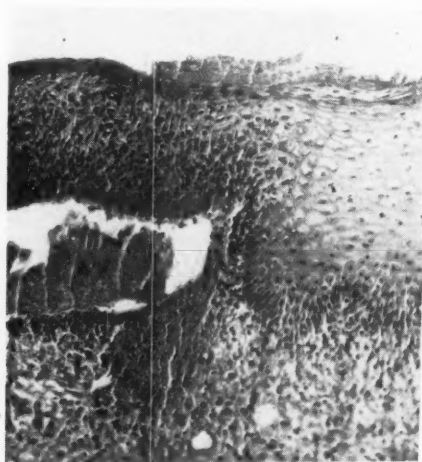


Fig. 13.

CASE 11.—Abrupt transition from normal epithelium on the right to hyperactive epithelium on the left.

Treatment

It is not the purpose of this paper to advocate surgery rather than irradiation in these extremely early carcinomas. Our attitude toward the treatment of carcinoma of the cervix, in general, is that all lesions of macroscopic size should be given a full course of radium and x-ray therapy. In these very early microscopic lesions, we believe that no one has had sufficient experience to be dogmatic in his preference for either surgery or irradiation. It is probable that the incidence of cures will be high by either surgery or irradiation. In our series, we have performed total hysterectomy in all cases except one. This one exception is the case in which the cervix was amputated in doing a Manchester operation. Following the discovery of early carcinoma in the amputated cervix, irradiation was instituted. We have favored surgery in order to obtain the cervix for study so as to substantiate or disprove our suspicion of cancer. Without doing this, we would still be in doubt as to the absolute diagnosis in several of the afore-mentioned cases. We have also favored hysterectomy in order to learn whether these early lesions can be cured with the conservation of one ovary. The average age of these patients is 36 years, and they are not rare in the twenties. The preservation of a functioning ovary in the younger women of this group would give surgery a decided advantage over irradiation. Since the ovaries are involved in cervical cancer late in the course of the disease, it seems probable that ovarian preservation will prove permissible in this group of cases.

The operation which we have carried out is a marked modification of the Wertheim technique. We do not hug the cervix as in total hysterectomy for benign disease. On the other hand, we make no dissection of the glands. If on examination of the removed uterus the lesion is found to be more extensive than originally suspected, we would entrust the destruction of possible glandular metastases to postoperative irradiation. We have frequently passed ureteral catheters preoperatively in order to facilitate the locating of the ureters at the operating table. This procedure requires but a few minutes either before or after anesthetizing the patient, and often proves to be of great value to the operator. The ureters can be identified easily and repeatedly in the course of the operation, permitting ligation of the uterine vessels well away from the cervix, and the removal of a generous vaginal cuff without endangering the ureters as they turn forward anterior to the vagina. Dissection of the ureters as in the typical Wertheim operation becomes unnecessary and thus postoperative ureteral fistulas never occur.

All of the 16 cases reported herein are well, but that fact is of no statistical significance since the longest time that has elapsed since hysterectomy is four years. The patients will be followed with great care to learn the ultimate results.

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Discussion

DR. GEORGE H. GARDNER, CHICAGO, ILL.—If anyone doubts the nature of these lesions, may I assure him that they are undoubted carcinomas of the cervix. Dr. TeLinde and Dr. Galvin have had an unusual experience with these early squamous cell cancers of the pars vaginalis, chiefly because they are continuously searching for them. I, on the other hand, have seen only a half dozen similar cases.

Their observation that the first evidence of cancer occurs in the basal layer of cells has not been confirmed in my specimens. Nevertheless, I do subscribe heartily to the concept that squamous cell cancer of the cervix can be diagnosed before actual invasion occurs. Such a diagnosis is based on radical alterations in the normal architecture of the squamous epithelium, plus individual cell changes, i.e., variations in the size, shape and intensity of staining of cells, plus mitotic figures. This type of cancer is, in reality, an intraepithelial process. Incidentally, it is sometimes difficult to be absolutely certain that early invasion has actually occurred.

We must be willing to diagnose cancer on the basis of cell changes alone, and then have the fortitude to treat the patients accordingly. I cannot subscribe to the practice of repeated biopsies as a follow-up in women where evidence of intraepithelial cancer is discovered, but cancer is not diagnosed because invasion has not occurred. One must look upon repeated biopsies as repeated traumas to the cervix.

Another of the authors' observations emphasizes a fact that may prove startling to some, viz., that slow growth of cancer is probably the rule, not the exception. They mention the youth of their patients and also cite a case that had been reported from the Johns Hopkins Clinic, in which almost nine years elapsed between the recognition of noninvasive intraepithelial cancer, and the appearance of a classical evting clinical cancer of the pars vaginalis.

In this connection I wish to comment on another feature of some uterine carcinomas, viz., their tendency to spring up, apparently simultaneously, in several areas, or over an extensive surface, rather than being restricted to a single focus.

I must question one of their indications for treating these early invasive cancers by operation. They recommend that it is advantageous in younger women to save a functioning ovary. Few of us believe that estrogens in therapeutic dosage have a carcinogenic action, but some of us carefully withhold estrogens from cancer patients. The castrated woman, under treatment for genital cancer, who complains of hot flashes, probably should not be treated with estrogenic hormones. If Dr. TeLinde prefers to operate on his cancers of the cervix, I sincerely trust that he has other, and more valid, indications for surgery than the desire to avoid an early menopause. It is not at all unlikely that women with genital cancer should be castrated, as an essential part of their treatment.

This timely paper is a boon to the proponents of routine total hysterectomy. It serves as another lethal argument against frequent use of the subtotal operation, and it should stimulate all of us to search more zealously for similar early cancers of the cervix.

DR. KARL H. MARTZLOFF, PORTLAND, ORE.—I would like to emphasize again Dr. TeLinde's general observation concerning the attitude of some toward those changes in the stratified cervical epithelium to which such appellations as "precancerous lesion," "carcinoma in situ," "Bowen's disease," "preinvasive cancerous change" or "noninvasive potential carcinoma" have been given. The ex-

pression "noninvasive carcinomatoid change" is, I believe, more realistic, for it tends to express the idea, that the lesion in question, while resembling cancer, may in fact not be a carcinoma. This I believe is important, for upon it hinges the decision as to one's further conduct toward such an afflicted patient. If this noninvasive change, and I am not now discussing Dr. TeLinde's major thesis, is regarded as an irreversible, progressive process, then patients so afflicted may be subjected to unnecessary surgery or radiation therapy. It is worth remembering that patients so afflicted have remained well for years when nothing more was done than local removal of tissue for diagnosis. A few of our own observations confirm this, but particularly pertinent are the studies of Stevenson and Scipiades.

I am in agreement with Dr. TeLinde that if one is to regard a given lesion as one probably associated with a coexisting but as yet undemonstrated cancer, then surgical removal (panhysterectomy) is the method of choice. This gives opportunity for study of the entire specimen and final decision as to the correctness of one's pre-operative estimation of the lesion. In no other way can a background of exact information be obtained.

I am dubious of the advisability of frequent removal of tissue for histologic study. I prefer, when the original biopsy reveals such a carcinomatoid change, either cervical amputation or preferably a wide conical endocervical enucleation combined with a low amputation utilizing the Sturmdorf flap principle. This accomplishes three purposes: the procurement of adequate tissue for intensive study, the avoidance of prolonged delay before arriving at a final decision, and the probable complete removal of suspicious pathological tissue when no cancer exists.

Finally, we come to the nucleus of Dr. TeLinde's study, viz., the re-evaluation of his preliminary histologic studies on the basis of the coexisting early cancer demonstrated only after the entire cervix became available for study. I would like to ask Dr. TeLinde what he considers as acceptable evidence of early bona fide invasion? Also may not the patient who developed full blown cancer 8½ years after a non-invasive carcinomatoid change was demonstrated have had an undiscovered bona fide cancer at the time of the original biopsy? Is it also not possible that this final manifestation of cancer may have been purely coincidental and that the cancer did not arise necessarily at the site of the previously demonstrated noninvasive carcinomatoid change?

I make these inquiries because Hinselmann and his proponents have repeatedly stated that cancer of the vaginal surface of the cervix arises on the basis of a pre-existing leucoplakia. However, up to the present time this has not been proved. In saying this I am not unmindful that coexisting leucoplakia and cancer have been reported, and I confess my sympathetic attitude toward the theory that bona fide cancer probably may develop from an area of noninvasive cancerlike change.

Dr. TeLinde's most pertinent observation is that all of the noninvasive carcinomatoid changes observed in his preliminary biopsies showed among other changes complete loss of cell differentiation and layer formation. It is therefore inferred, that these alterations may offer histologic evidence sufficient to warrant the assumption of a coexisting but unverified cancer. This is not only an interesting observation but one of great potential importance and one that, I am sure Dr. TeLinde will agree, requires confirmatory evidence.

In conclusion, it should be emphasized that these observations of Dr. TeLinde do not and are not intended to show that bona fide cancer originates in an area of noninvasive carcinomatoid change. More probably they illustrate the cytological changes that may occur in the stratified epithelium of the cervix where it impinges on established cancer producing what has been described as collateral cancer.

DR. NATHAN P. SEARS, SYRACUSE, N. Y.—Since 1931, we have been carrying out a somewhat similar procedure. When any specimen of cervix is obtained showing a lack of stratification, the patient is put on a special list and frequently examined, sometimes as often as every month, in other cases every six months or a year. We

have picked up two cases after a year, and some diagnoses were confirmed within a month or two after our first suspicious biopsy was made. In this way, we will be able to detect a great many more of these cases, and therefore prevent deaths from cancer of the cervix.

DR. EMIL NOVAK, BALTIMORE, MD.—Year after year, before this Society and before practically every other gynecological society, there are discussions as to the treatment and the results of treatment for cancer of the uterus. While improvements are from time to time noted, they are on the whole unimpressive, and no one is particularly enthusiastic about them. For the present the only avenue to better results, and an obvious one, is through a combination of popular education and a more intensive and concentrated study of the cervix, in an effort to unearth the very early cases which will yield a very high percentage of cures.

The most important lesson to be drawn from Dr. TeLinde's paper is that one should go slowly in diagnosing preinvasive carcinoma. In almost all of his cases, in which definitely cancerlike changes were found at biopsy in the surface mucosa alone, without invasion, later biopsy or hysterectomy revealed invasiveness at some point or other. It is true that a small group of cases has been reported in which even serial study has failed to reveal invasion, and concerning the significance, the nomenclature and the treatment of this group, there has been much discussion and much difference of opinion. But these cases are far less numerous than those which, on more intensive study, reveal invasiveness, so that the diagnosis of cancer would be accepted by all pathologists. To put it another way, one would not make any mistake if one considered as cancer all those cases of extreme cancerlike changes in the epithelium even if the biopsy does not happen to show areas of outspoken invasion.

The rub in the situation lies in the determination of what constitutes a minimum of epithelial hyperactivity on which to base the assumption of cancer, for all degrees are encountered, as exemplified in the various rubrics of leucoplakia described by Hinselmann. The lesser degrees represented by rubrics I and II are probably of no significance, and it is only the rubric III cases, corresponding to those shown by Dr. TeLinde today, that one is justified in grave suspicion. In most biopsy sections corresponding to this picture, more extensive study will, as already mentioned, reveal invasiveness at some point, so that they will probably be placed in rubric IV, or genuine and undoubted cancer.

As for minor degrees of hyperactivity, they are probably of no significance in relation to cancer. In interpreting them we must consider individual variations, the influence of inflammatory irritation, and possibly cyclic or other endocrine variations. The vaginal mucosa is much influenced by hormone factors, and there would seem to be no reason why the same thing should not apply to the squamous epithelium of the portio, although we have very little direct information on this point as yet.

DR. I. C. RUBIN, NEW YORK CITY.—In 1910 I was able to report three cases of what we called at that time "incipient" cancer of the cervix. These cervixes were removed from cases of uterine prolapse at the von Rosthorn Klinik. The lesions corresponded to those this morning, and to those which Dr. Cullen showed some twenty years later. At that early period Schottlaender, pathologist at the von Rosthorn Klinik, was alone in maintaining that the mitotic activity of the cells, loss of the basal-cell arrangement with local regional and some subjacent lymphatic involvement underlying the proliferated hyperactive epithelium, without any further spread, was enough to characterize the lesion as cancer. I have seen several cases since that time, two of them since we have been doing the Fothergill operation more frequently, in which the rate of growth was extremely slow.

A woman in the late forties on whom I did a trachelorrhaphy with curettage had a lesion which corresponded quite accurately to this picture, one small fragment showing infiltrating squamous cell carcinoma (medium ripe). I urged the husband to

see to it that a hysterectomy be done or that she have x-ray or radium therapy, which he refused for fear of scaring her, since she had cancerophobia. I lost track of her for several years during which time she had estrogenic treatment receiving some 10 million international units of estradiol. When I saw her in 1943, some 7 years after the operation, her cervix was quite the same and perfectly healed. She still refuses to have anything done.

From what Dr. TeLinde's evidence shows in his beautifully carried out pathological examinations I think we are dealing in some of these cases with what is analogous to a basal-cell carcinoma. In other words, this lesion is an epithelioma of the vaginal portio which has relatively benign activity and for that reason may lie dormant and localize without producing remote metastasis for many years.

DR. F. H. FALLS, CHICAGO, ILL.—I want to emphasize what Dr. TeLinde has said as to the importance of removing the whole endocervix in operating upon these carcinomas. We do a Sturmdorf operation, excise the cone and open it out so as to make eight blocks. We start taking sections down the block and if we find nothing in the early sections, we assume that the cervix is negative. But if we find these early changes, the beginning Schiller line, we cut sections right through. We have made as many as 80 slides from one block finally to detect the carcinoma. The Sturmdorf operation is a good one for cervicitis quite apart from its advantages in detecting early carcinoma. Therefore, we believe that patients with chronic cervicitis that do not yield to ordinary treatment should not be treated by the cautery but by the Sturmdorf operation. This yields the best possible biopsy material.

After removing the early lesion by the Sturmdorf operation, the question is whether we are obligated to remove the uterus. That is hard to say. In a young woman of 24 or 25 years of age, we leave the uterus keeping the patient under close observation. If the patient is near the forty-year mark, we recommend the removal of the uterus. In some of these cases we have done the Schiller test before operating, have marked the point of the positive test and then after the Sturmdorf operation found that there was no invasion. A little beyond that point, however, we have found an early carcinoma, often where the Schiller test was negative.

DR. TELINDE (closing).—The question of repeated biopsy has been raised. I have seen no practical objection to it, and can see no alternative when one is in doubt from the first biopsy. We have coned the cervix only a few times, but believe it is a good way to get a very satisfactory biopsy. If one does this by the Sturmdorf technique, however, it is necessary to wait at least four weeks for the wound to heal, and all infection to disappear before proceeding with the total hysterectomy. If one were going to treat the patient with radium, one could start that therapy very soon after the conization.

Dr. Gardner raised the question of the advisability of saving one ovary when doing a total hysterectomy. We have discussed that question a great deal, but the effect of estrogen upon carcinoma is strictly theoretical, and we do not believe that we should be deterred from saving an ovary on theoretical grounds. We would not save an ovary in a woman past 38 years of age, but believe it is worth doing in the younger individuals. Dr. Martzloff brought up the question as to whether the patient who had a gross carcinoma eight years after the biopsy might not have had it long before that time. I think that is a possibility, but one cannot prove it.

In undertaking this study we appreciate that these intraepithelial changes have been described in the literature repeatedly. There seemed, however, to be one weak point in most of the published articles and that was proof of the relation of these surface changes to invasive carcinoma. We have attempted to prove this in these studies. I hope that we have stimulated a little interest in this subject, and I am glad that I have had the opportunity to present this paper at this time as it fits in so well with Dr. Macfarlane's work in her volunteer health checkups. I am sure that we were missing many of these early lesions before, considering the frequency with which we are finding them now.

THE SECOND STAGE OF LABOR—THE DESCENT PHASE*

L. A. CALKINS, M.D., PH.D., KANSAS CITY, KAN.

(From the Kansas University School of Medicine)

SOME years ago, we endeavored to demonstrate that the first stage of labor was a very simple process, controlled by the frequency and intensity of labor pains balanced against the resistance offered by the cervix.¹ The passenger, either with respect to its size or its presentation, had no effect on the progress of the first stage. With the possible exception of ruptured membranes, nothing other than labor pains and cervix was of any major importance.

A similar study of the second stage of labor reveals quite a different situation. Here, we find a very complicated process, affected by many different considerations. Voluntary effort of the patient is of as much, if not greater, importance than the involuntary contractions of the uterus. Ruptured membranes facilitate descent, but may act as a deterrent factor in negotiating the pelvic floor. Size of the passenger is of considerable importance, particularly in primiparas. Presentation is of little importance in some respects, but a definite factor as regards internal rotation. The station at which internal rotation takes place has a definite bearing on the rapidity and ease of delivery. The frequency and intensity of labor pains are of relatively little moment in multiparas, but a factor of considerable importance in primiparas.

Since there are so many factors involved and since these factors are more or less interdependent, clarity of understanding will be served by discussing only one of them at this time. The remainder of this discussion will concern itself with that phase of the mechanism of labor known as descent.

The textbooks give one the impression that descent, while partial in the first stage, is a more or less continuous process during the second stage of labor. In the present series of some, 2,400 primiparas and 1,700 multiparas, our findings are not quite in accord with this impression. In something over half (54 per cent) of all patients, the head was definitely on the pelvic floor at the time the cervix receded over the head. It has been our custom to say the cervix was completely dilated only when it was also completely retracted. Very frequently, there is no descent when the cervix is seemingly dilated but still palpably present around the head. Palpation at the height of the uterine contraction will show this remaining rim of cervix to be tightly clamped against the head and to be preventing descent thereof. As soon as the cervix is retracted, the head will frequently almost fall

*Presented at the Sixty-Eighth Annual Meeting of the American Gynecological Society, Hershey, Pa., June 19 to 21, 1944.

down through the pelvis to the perineum. Conversely, the head may be on the pelvic floor for a matter of minutes or even hours before dilatation is complete. The assumption that the patient is in the second stage of labor merely because the head is on the perineum may well lead to the impression that forceps delivery will be required because of "lack of progress." In these patients in particular, it is unsafe to depend upon the findings by rectal examination, and it has been our custom for the past few years to do vaginal examinations routinely under these circumstances (i.e., head on perineum with no progress).

In this group of patients, with the head on the perineum at the time dilatation is complete, the second stage is wholly concerned with the negotiation of the pelvic floor.

In the remaining patients (something less than half of all cases in the present series), the presenting point is at a somewhat higher station at the time dilatation is completed. This station may vary all the way from approximately 1 centimeter above the pelvic floor to a point well up in the pelvis. *In this latter group of patients, descent to the pelvic floor must precede the pelvic floor phase.* This descent may require all the way from a very few minutes to as much as an hour or more. After it is completed, there then remains the pelvic floor phase, which is exactly like the whole of the second stage in the first group of patients. It has seemed advisable to us when referring to the second stage in this second group of patients to speak of "Descent Phase" and "Pelvic Floor Phase." The duration of the second stage in this group cannot be directly compared with the second stage in the first group. Failure to make this differentiation inevitably leads to inaccurate judgments as to the proper amount of progress in individual patients and, therefore, to ill-advised abstinence from operative delivery in the first group and ill-advised early interference with the second group.

Etiology of High Station

Since more than half of all patients in this series had the head on the perineum at the time dilatation was complete, it becomes of interest to try to determine the etiology of the high station in the smaller group.

TABLE I. ETIOLOGY OF HIGH STATION
(AT ONSET OF SECOND STAGE)

Cervix and L.U.S.	33% factor
Unruptured membranes	15% factor
Large baby (over 3,500 Gm.)	5% factor
Occiput posterior } Deflexion }	Negligible
Abnormal presentation, hydrocephalus, etc., not studied.	

One major factor (the cervix and lower uterine segment), one somewhat less important factor (the time of rupture of the membranes), and

several almost negligible factors seem worthy of consideration. It is quite apparent that the cervix and lower uterine segment are much stretched and markedly thinned out before the onset of labor in a small proportion of patients. Some of these individuals are observed to "carry their babies on their heels" for the last several weeks of their pregnancies. Considerably more frequently, one observes the head descending through the pelvis during the first stage so that it may reach the pelvic floor by the time the cervix is only 5 or 6 centimeters dilated. Stretching of the lower uterine segment (and parametrial tissues?) would, therefore, seem to precede effacement and dilatation of the cervix in a small number of individuals, and to proceed apace in a considerable fraction of the remainder. Failure of stretching of the lower uterine segment and cervix would naturally prevent descent of the head until the cervix is completely dilated and, therefore, completely removed as an obstructive factor to descent. As nearly as could be judged from this present series of patients, 33 per cent of all individuals fall into this category. In this 33 per cent of patients, the station of the head is high at the time dilatation is complete regardless of all other factors in the individual.

The next most important consideration is the time at which the membranes rupture. Of 2,397 patients whose membranes had been ruptured previous to the completion of dilatation, 59 per cent (1,404 patients) had the head on the perineum at the time dilatation was complete. Of 1,185 patients in whom the membranes did not rupture until after the completion of dilatation, only 44 per cent (521) had the head on the perineum at the time dilatation was complete. That unruptured membranes can act as a deterrent to descent is particularly evident in multiparas whose pains are very poor, and who exert little or no voluntary effort. One patient in this series had complete dilatation for four hours with the head just above the pelvic floor and no progress. Rupture of the membranes was followed by birth of the baby within one minute and without a uterine contraction. The difference between 59 per cent and 44 per cent would suggest that late rupture of the membranes relative to the time of completion of dilatation is approximately a 15 per cent factor in preventing early descent.

Three other clinical findings were carefully studied and found to be unimportant or of negligible weight in determining station as of the time of complete dilatation. The presenting point in 52 per cent of primiparas was on the perineum, while in multiparas, 59 per cent was at a low station; 53 per cent of occiput anterior as against 51 per cent of occiput posterior; 55 per cent of the small and medium-sized babies and 50 per cent of the large babies (3,500 grams and over). Baby size alone, therefore, of these three factors might be considered as of minimum importance, and to be, at most, a 5 per cent factor. If we combine the factors favorable for a low station, namely, small and medium-sized multiparas' babies, with early rupture of membranes, we find that 66

per cent are on the perineum at the time the cervix is completely dilated; whereas, primiparas with large babies and unruptured membranes, have only 34 per cent on the perineum at the time the cervix is at complete dilatation. It is thus apparent that the resistance offered by the cervix is a very major factor in preventing early (first stage) descent; unruptured membranes are a considerable factor; and baby size, parity, and posterior occiput position are negligible—certainly so for the individual patient.

TABLE II. THE DESCENT PHASE

Voluntary effort	Most important
Character of pains	20-minute factor
Large baby	6-minute factor
Unruptured membranes	3-minute factor
Occiput posterior	Negligible unless combined with other adverse factors
Late internal rotation	
Incomplete flexion	

The Descent Phase of the Second Stage

The length of time necessary for, and the factors concerned in, descent occurring in the second stage are of considerable interest. (Table II.) Several factors are concerned with this process, but only two are of anything like major importance. It is not yet apparent whether the relative amount of voluntary effort exerted, or the relative intensity and frequency of the uterine contractions is the more important. It is quite apparent that patients with good pains coming at frequent intervals will bring about complete descent to the pelvic floor in an average of some twelve minutes in primiparas (multiparas—six minutes). Voluntary effort is unnecessary and relatively unimportant in this situation. On the other hand, if the contractions are quite weak and infrequent, good voluntary effort is almost a necessity and will frequently produce descent in ten to fifteen minutes. With average cooperation by the patient, descent requires an average of forty minutes, and with no voluntary effort may well require more than an hour. Since we do not have a precise method of measurement, we can only say that it is our present impression that voluntary effort is more important than uterine contractions, both with respect to the descent phase and the pelvic floor phase of the second stage of labor. This is more striking in multiparas than in primiparas.

Effectiveness of the uterine contractions can be somewhat more readily judged. Descent in primiparas with no obstructing factor and with good pains occurs in some twelve minutes. Where the pains are weak and infrequent, the pelvic floor may be reached in a few minutes, but may require forty minutes or more. The average in most such groups is thirty to thirty-five minutes. For purposes of comparison with the other factors involved, the labor pains could, therefore, be said to be a factor of twenty minutes or more.

Perhaps next most important is the size of the baby (occiput presentations only are being considered in this paper, and abnormal presentations are, therefore, automatically excluded). In primiparas, babies of 3,500 grams and over, require on the average some six minutes more for completion of descent (multiparas three minutes) than the average of small and medium-sized babies. Marked variations are observed, and it is not infrequent that large babies apparently descend more rapidly than small ones. These figures quoted are, therefore, to be looked upon only as averages or general tendencies. On this basis, largeness of baby could be said to be a six-minute factor.

In this group of patients, it was noted that if internal rotation took place during descent, that descent was completed on the average more rapidly than if internal rotation did not occur until after the presenting part was definitely on the perineum. Here again, the differential was about six minutes for primiparas, and three minutes for multiparas. This series is not sufficiently large for us to be certain whether this differential does not represent inadvertent selection. It may well be that some factor which inhibits internal rotation during descent also inhibits descent itself; as for example, the large size of baby above noted. In this connection, it was supposed by us that moderate degrees of deflexion would be found to be of considerable importance. Again, the size of the present series does not enable us to be certain that such is the case. At present, it would seem that deflexion of the head does not materially inhibit descent except when associated with large babies, and that it then does not particularly magnify the inhibition characteristic of the large-sized infant.

Occiput posterior descends as rapidly as occiput anterior, if the baby be of small and medium size. In the present series, occiput posterior averages for some rather large groups are actually less than occiput anterior averages. The large baby, however, with occiput posterior will show an average in excess of that of exactly comparable occiput anterior groups. The differential is four to eight minutes for primiparas, and zero to six minutes for multiparas. It would seem to us that occiput posterior, as a deterrent of descent, can be entirely neglected in the individual patient, as the effect is too inconstant for individual patient consideration.

If the membranes are ruptured previous to the completion of dilatation and the head still remains high until dilatation is complete, it was found by us that descent was more rapid in the second stage than if the membranes were still intact while descent was taking place in the second stage. The differential here is approximately four minutes with good pains and as much as eight minutes for exactly comparable groups whose pains are poor. Previous rupture of the membranes, therefore, facilitates descent. It is interesting, however, that all this advantage is lost after the head reaches the perineum, and the total time consumed by the

descent phase and the pelvic floor phase (combined) becomes exactly the same for those with early and those with late rupture of the membranes.

Failure of descent was observed only twice in this series. There was no instance of contracted pelvic inlet interfering with descent. One patient cared for during this period had a pelvis sufficiently small that elective cesarean section was done. Some five or six patients had sufficiently small pelvic outlets that there was delay in the pelvic floor phase. In no instance was this of serious degree. The obvious delay produced by abnormal presentations, such as breech or brow, is not discussed here, as these abnormal presentations were not included in this study. Hydrocephalus occurring during this period happened to be associated with brow presentation in every case. There were observed one case of markedly delayed descent and one case of failure of descent. The marked delay was brought about by a huge amount of scar tissue in the pelvis following a previous ischiorectal abscess. The failure of descent was the result of the baby being suspended in a loop of its own umbilical cord. After many hours of failure of descent, a high median forceps delivery resulted in rupture of the cord followed by an extremely easy forceps extraction. Complete failure of descent is so rare in our experience that we have come to the rather firm conclusion that apparent failure of descent or apparent delay in descent is almost exclusively due to the fact that the cervix is not yet quite completely dilated. It is, therefore, a rule in our clinic that if the head is not on the pelvic floor within thirty minutes of the time dilatation was thought to be complete, a vaginal examination is to be done. This will nearly always reveal a rim of cervix still holding the head at a high station. The patient is, therefore, still in the first stage of labor, and the second stage has not begun.

Reference

1. Calkins, L. A.: *AM. J. OBST. & GYNEC.* 42: 802, 1941.
KANSAS UNIVERSITY HOSPITAL

Discussion

DR. HOWARD C. MOLOY, New York, N. Y.—The observations and conclusions of Dr. Calkins' paper confirm the general accepted opinion in regard to the importance of cervical dilatation and retraction, and the role played by the membranes in labor. Some years previously, we were interested in this subject at the Sloane Hospital and in a few instances studied cervical dilatation and retraction by the use of lateral roentgenograms after lead shot had been fixed to the anterior and posterior lip of the cervix. Until complete dilatation of the cervix had been obtained, the shot did not elevate. As the head descended through the completely dilated cervix, however, the cervix apparently rapidly retracted, either by passive force or by pulling through action of the uterine muscles proper. It was surprising to note that the cervical rim in normal labor can be retracted as high as the plane of the pelvic inlet.

The second point which interests me is not mentioned in the paper; namely, the possible role of pelvic size and shape. I think this factor is too important to be completely ignored in any report pertaining to the study of labor. Dr.

Calkins states that, "It was noted that if internal rotation took place during descent, that descent was completed on the average more rapidly than if internal rotation did not occur until the presenting part was definitely on the perineum." He suspects a factor exists to explain this observation by stating, "It may be that some factor which inhibits internal rotation during descent, also inhibits descent itself, as for example, the large size of baby," but does not refer to the possible influence of pelvic shape and size. We believe that pelvic shape plays a decided role in determining the level at which internal rotation takes place. Sometimes this is due to the shape of the inlet.

Torpin reported at the recent meeting of the American Medical Association in Chicago an interesting paper on the role played by the placenta upon head position. He studied roentgenologically pelvic shape in twelve cases of spontaneous face to pubis deliveries. In at least one-half of these cases he found marked anthropoid pelvises or pelvises with converging side walls to explain the failure of internal rotation. In the remainder, the presence of a large pelvis led him to suspect that the position of the placenta may have been a factor in the cause of this mechanism.

In five or six cases in Dr. Calkins' report there was definite delay in the pelvic floor stage or at the outlet. Although, in these cases, delivery was effected without difficulty, I feel certain that pelvic abnormalities in the outlet contributed to the delay or arrest. I would like Dr. Calkins to comment upon the possible influence of the bony pelvis in those cases of delayed internal rotation and those few cases which experienced difficulty during the pelvic floor phase.

The question of the significance of deflection attitudes of the head has for years entered into most discussions concerning the mechanism of labor. The fact that the anterior fontanel can be easily palpated is used as an argument that deflection exists, yet stereoscopic films may show that the head actually is quite well flexed in regards to the pelvis. While I agree in general with Dr. Calkins, therefore, that deflection does not play a significant part in the mechanism of labor, I would be interested in the clinical methods he used to determine this point.

The third and final point of interest deals with the remarkably low incidence of operative deliveries in this large series of cases. Failure of descent was observed only twice in the series and in only five or six cases was there delay at the outlet. I believe the excellent results indicate attention to the intrapartum care of the patient, the careful use of analgesia with adequate fluid intake in cases of protracted labor to prevent the uterus and the forces of labor from losing their efficiency.

It is doubtful, if it is entirely justifiable to compare the operative incidence from widely separated hospitals inasmuch as racial stock is a very important factor. The number of operative deliveries increases in mixed populations and, in large cities, racial types differ, and abnormal physical types, which predispose to soft part and bony dystocia are not infrequently encountered. All of these factors must be considered in the appraisal of obstetrical statistics.

DR. NORRIS W. VAUX, Philadelphia, Pa.—We all, I think, are in accord that in about 50 per cent of our patients who present no abnormalities of the birth canal or fetal obstruction, the presenting part reaches the pelvic floor at the completion of the first stage of labor. The other 50 per cent of patients, those in whom dilatation may occur before the descent phase is completed or those in which the presenting part is on the pelvic floor before the cervix is completely dilated, are the ones in which we are particularly interested.

It has always been our custom at the Lying-in Hospital to instruct the nursing staff that until the cervix is fully retracted or completely dilated not to allow the patient to use any of the accessory muscles for expulsion or aiding in the descent of the vertex. In all probability the use of the accessory muscles along

with the uterine contractions causes the cervix to lacerate and the membranes to rupture before the hydrostatic action of the unruptured sac upon the cervix is completed.

Rupturing of the membranes before complete dilatation is still a disputed and controversial subject. Leaving the membranes intact, if possible, until the cervix is fully dilated when Nature by virtue of the uterine contractions alone causes spontaneous rupture is, I believe, the best method to pursue. Although the labor might be somewhat delayed throughout the second stage, it is quite evident that the descent is more rapid after the rupture of the membranes if the cervix is fully dilated.

The management of the pelvic floor phase is no longer a matter for too serious consideration. With the recent advent of caudal analgesia the first stage of labor has become rapid and astounding in its completeness. The perineal floor is completely relaxed so that it is unnecessary to consider a delay in either the first stage of labor or the descent phase of the second stage of labor as the mechanism is completely changed at this time. This rapid dilatation of the cervix and descent of the presenting part under caudal analgesia is one of the outstanding points which occur when this method of analgesia is used. I am now confident that the accessory muscle force which previously was considered necessary in the bearing down action of a patient during the descent phase is no longer necessary or justifiable as the presenting part under caudal analgesia relaxation is placed promptly at the vaginal outlet and is frequently spontaneously delivered without any exertion on the patient's part. When this stage is reached, the patient can be promptly delivered, and should be, by the simple application of outlet forceps.

I am glad that Dr. Calkins has stressed the importance of the accurate diagnosis of position and station of the presenting part by vaginal examination, as well as the amount of dilatation and effacement of the cervix which exists. Too many rectal examinations, it seems, are done solely for the purpose of estimating the descent of the presenting part as it is not always possible by rectal examination to make an accurate diagnosis of the completely dilated and effaced cervix. A careful and well-executed vaginal examination is harmless and too frequent rectal examinations may produce more infection than one good vaginal examination.

I cannot subscribe to the conservative methods of delivery after the presenting part has reached the pelvic floor. Either manual or forceps rotation or decomposition and extraction of the breech can be very easily accomplished if the relaxation of the perineum exists as in a properly acting caudal analgesia.

Caudal analgesia will have to be given eventually its proper place in the conduct of labor, as it has been definitely conceded that dilatation of the cervix is more rapid and the descent phase is shortened considerably in both the multiparous and the primiparous patient.

PATHOLOGY OF MALIGNANT NEOPLASM OF THE CERVIX COINCIDENT WITH PREGNANCY*

CHARLES R. MAINO, M.D., ALBERT C. BRODERS, M.D., AND
ROBERT D. MUSSEY, M.D., ROCHESTER, MINN.

(From the Mayo Clinic)

IN A recent communication by two of us (Maino and Mussey)¹ a report was made of a study of twenty-five cases of carcinoma and one case of sarcoma of the cervix which complicated pregnancy. As an incidental finding pregnancy occurred in 0.7 per cent of the cases of malignancy of the cervix observed at the Mayo Clinic in nearly thirty-two years, that is, from July 1, 1909 to February 28, 1941. In this series of cases, many of which were observed before the present methods of treatment were developed, the prognosis appeared to be at least as favorable as the prognosis of carcinoma of the cervix which is not coincident with pregnancy.

Of the entire group of twenty-six patients, in twenty instances a follow-up period of at least five years had elapsed on February 28, 1941; of these twenty, six were alive and free of recurrence five or more years after the diagnosis was made, a "cure" rate of 30 per cent. On March 15, 1944, four more of the six remaining patients (21, 22, 23 and 24) had been followed at least five years; patients 21 and 22 were alive and free of recurrence, making a total of eight living patients out of twenty-four, a "cure" rate of 33 per cent.

The scope of the communication referred to in the previous paragraphs did not permit adequate description of the pathology of the disease. It is proposed in this paper to present in greater detail the pathology of malignant neoplasia of the cervix in cases in which the patients were also pregnant. The paper will include a résumé of the literature pertaining to the pathology of the disease, its symptoms as they relate to the type, stage and microscopic grade of the neoplasm, a study of the pathologic characteristics of the cases and consideration of the connection between these phases of the pathology and the prognosis. Symptoms, diagnosis, and treatment, and their bearing on the prognosis of carcinoma of the cervix coincident with pregnancy have been described previously. For the information of the reader, Table I of the former paper, with some additional data, is appended.

*Read by Dr. Mussey at the Sixty-Eighth Annual Meeting of the American Gynecological Society, Hershey, Pa., June 19, 20 and 21, 1944. Abridgment of a portion of thesis submitted by Dr. Maino to the Faculty of the Graduate School of the University of Minnesota in partial fulfillment of the requirements for the degree of M.S. in Surgery. Dr. Maino is now on active service in the Medical Corps of the United States Navy. The opinions and assertions contained herein are the private ones of the authors and are not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large.

A large majority of malignant neoplasms of the cervix are squamous cell epitheliomas. Among the cases of forty-five authors who reported the microscopic examination of the fifty-nine cases of carcinoma of the cervix coincident with pregnancy, squamous cell epithelioma was present fifty times, adenocarcinoma seven times and the mixed cell type was observed twice.

Certainly squamous cell epithelioma predominates in reports of these cervical neoplasms. Bowing² stated that squamous cell epitheliomas comprise 90 per cent, adenocarcinoma 5 to 8 per cent and the remainder a combination of these two types of carcinoma; these figures include nonpregnant as well as pregnant patients.

Three cases of adenocarcinoma of the uterine corpus coincident with pregnancy have been reported by Schumann³ in 1927, Wallingford⁴ in 1934, and Westman⁵ in 1934.

The normal histologic changes in the cervix during pregnancy have been reported by Hofbauer,⁶ Levey⁷ and others. During pregnancy both the surface epithelium and glandular elements proliferate. The single layer of columnar cells with basal nuclei becomes stratified, that is, becomes several layers in thickness and the nuclei are then not usually found in the basal part of the cell. The glandular epithelium branches and permeates the stroma, forming a loose tissue almost like a spongiosa. Vacuoles or sinuses appear in the mucosa between the layers of columnar cells. The basal cells may show mitosis and the basement membranes may be indistinct. The resulting picture has been confused with that of malignant neoplasm. However, the cells are uniform and the basement membrane is intact; facts that should help distinguish the changes occurring in pregnancy from those of carcinoma.

Hofbauer⁶ mentioned a proliferation of subepithelial cells which may push up and even entirely replace the columnar epithelium. These new cells then resemble stratified squamous epithelium. Fluhmann⁸ earlier had commented on small basal cells or perhaps what may be cell rests which, by proliferation, raised the cylindrical epithelium and replaced it and then became differentiated into squamous epithelium. He termed this phenomenon epidermalization and warned that this benign tissue may be confused with cancer. His material, although obtained from nonpregnant women, seems to show a process similar to the changes described by Hofbauer in the pregnant cervix.

The cellular changes are at their height in the central and lower portion of the cervix at about the third month of gestation, while the upper portion undergoes these changes somewhat later.

Hyperplastic changes in the squamous epithelium of the vaginal portion of the cervix were described by Levey⁷ as paralleling those changes described for the columnar epithelium. Such hyperplastic changes in the squamous epithelium have been confused with low grade squamous cell carcinoma. The differential diagnosis is simplified, however, by the

TABLE I. MALIGNANT NEOPLASIA OF CERVIX COMPLICATING PREGNANCY: CLINICAL AND PATHOLOGIC FINDINGS

CASE	YEAR OF OBSERVATION	AGE (YR.)	GRAVIDA	PARA	STAGE OF PREGNANCY	MALIGNANT LESION		GRADE	DURATION OF SYMPTOMS	TREATMENT	RESULTS, INTERVAL AFTER TREATMENT	
						TYPE	STAGE				ALIVE	DIED
1	1909	33	5	3	Term	No report	IV		4 mos.	Porro cesarean operation, subtotal hysterectomy		3 days
2	1912	31	8	4	Term	Squamous cell epithelioma	II	4	5 mos.	Cesarean section; total abdominal hysterectomy		9 mos.
3	1915	33	5	2	22 wks.*	Squamous cell epithelioma	II	3	6 mos.	Total abdominal hysterectomy	23 yrs.	
4	1916	36	5	5	Term	Squamous cell epithelioma; adenocarcinoma	II	3	Post partum 1 mo.	Vaginal hysterectomy		15 mos.
5	1916	35	7	5	16 wks.	Squamous cell epithelioma	II		9 mos.	Radium and roentgen therapy		8 mos.
6	1916	40	8	8	Term	Squamous cell epithelioma	III		6 mos.	Radium and roentgen therapy		8 mos.
7	1917	34	11	3	6 wks.	Squamous cell epithelioma	I	4	7 mos.	Vaginal hysterectomy; radium and roentgen therapy	12 yrs.	
8	1918	35	2	1	18 wks.	Squamous cell epithelioma	IV†	3	2 yrs.	Hysterectomy elsewhere; radium and roentgen therapy here		6 yrs.
9	1919	37	11	11	Term		III		2 mos.	Porro's cesarean operation; radium therapy		4 mos.
10	1919	28	7	5	12 wks.	Squamous cell epithelioma	II	4	5 mos.	Total abdominal hysterectomy; radium therapy		4 mos.

*Through error period of gestation was stated as thirty weeks in previous paper.

†Operation by local physician; Stage IV here two years later.

‡Operation performed two months after vaginal delivery.

§This paper deals prevalently with carcinomas; this one case of myxosarcoma was not excluded from the series. Panhysterectomy was performed.

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11	1919	26	5	4	Term	Squamous cell epithelioma	I	4	1 yr.	Vaginal hysterectomy; radium and roentgen therapy†	2 yrs.
12	1920	29	5	4	32 wks.	Squamous cell epithelioma	IV	3	4 mos.	Cesarean section; subtotal hysterectomy; radium and roentgen therapy	1 wk.
13	1922	28	4	3	25 wks.	Myxosarcoma§	I	3	1 yr.	Panhysterectomy	1 yr.
14	1928	32	2	1	10 wks.	Squamous cell epithelioma	III	3	6 mos.	Radium and roentgen therapy	11 yrs.
15	1928	39	13	11	6 wks.	Adenocarcinoma	II	2	1 yr.	Total abdominal hysterectomy; radium and roentgen therapy	10 yrs.
16	1928	27	5	4	18 wks.	Squamous cell epithelioma	II	4	2 mos.	Total abdominal hysterectomy; radium and roentgen therapy	11 yrs.
17	1928	34	7	2	16 wks.	Squamous cell epithelioma	I	4	6 mos.	Total abdominal hysterectomy; radium and roentgen therapy	11 yrs.
18	1932	27	2	1	Term	Squamous cell epithelioma	IV	3	2 mos.	Radium therapy	5 mos.
19	1932	32	2	2	Term	Squamous cell epithelioma	III	3	9 mos.	Radium and roentgen therapy	10 mos.
20	1934	28	3	2	20 wks.	Squamous cell epithelioma	III	4	1 yr.	Hysterotomy; radium and roentgen therapy	22 mos.
21	1936	35	1	0	8 wks.	Adenocarcinoma	I	2	0	Total abdominal hysterectomy; radium and roentgen therapy	8 yrs.¶
22	1937	34	7	3	27 wks.	Adenocarcinoma	I	1	1½ yrs.	Wertheim's operation (1939); radium and roentgen therapy	5 yrs.¶
23	1939	26	3	1	15 wks.	Squamous cell epithelioma	III	3	6 mos.	Radium and roentgen therapy	17 mos.¶
24	1939	31	2	2	Term	Squamous cell epithelioma	II	3	14 mos.	Porro's cesarean operation elsewhere; radium and roentgen therapy	14 mos.¶
25	1940	25	3	2	10 wks.	Squamous cell epithelioma	II	4	3 mos.	Wertheim's operation; radium and roentgen therapy	4 yrs.
26	1941	41	9	6	14 wks.	Squamous cell epithelioma	I	4	1 yr.	Wertheim's operation; radium and roentgen therapy	3 yrs.

statement of one of us (Broders⁹) that he has not observed a case of grade 1 squamous cell epithelioma of the cervix.

Various authors have reported decidual reaction in 25 to 50 per cent of cases of pregnancy. According to Levey this incidence may be too high since swollen stromal cells easily may be confused with true decidual cells. Stöckl¹⁰ credited the decidua with a marked resistance to invasion by cancer. He stated that this explains the extreme rarity of invasion of fetal membranes or the fetus by the carcinoma.

In reporting a case of sarcoma of the uterus complicating pregnancy, in 1930, Hesseltine¹¹ mentioned the case reports of six others in the literature. DerBrucke,¹² three years later, apparently not familiar with Hesseltine's article, found only three cases previously reported. All this literature deals with sarcoma of the myometrium or of fibromyomas, except for one case reputed to have been of endometrial origin. There was no case of primary sarcoma of the cervix.

It seems pertinent to speak of symptoms as these relate to the stage and microscopic grade of carcinoma. Bleeding was the most common symptom of the disease, as there was abnormal bleeding in all but three cases; it was the primary symptom in nearly 90 per cent of the cases. Later, odorous, watery discharge was a common symptom. It is not surprising to find that there was a significant difference in the duration of symptoms up to the time of diagnosis, between the cases in Stage I and those in Stage IV of the disease. However, there is no significant predominance of grade 4 lesions among the further advanced cases (Table II).

Data in Table II regarding the stage or extent of the lesion, the duration of symptoms and the stage of pregnancy are of interest. These data show that the duration of symptoms of cases in which the lesions were of Stage II or III averaged approximately six months prior to the institution of treatment, the symptoms of cases in which the lesions were of Stage I averaged nine months, and the symptoms of cases in Stage IV averaged approximately three months. If the neoplasm can attain Stage IV in a third of the time that it may exist as a Stage I lesion, then one would expect to find the more rapidly growing high grade carcinoma to occur in the Stage IV group, but when the grade of the neoplasm is checked for various stages, there is no definite tendency for grade 4 lesions to occur in the more advanced stages. This may be explained, perhaps, by the restraining influence on cancer of the cervix attributed to pregnancy by some writers.

Among the six cases in which the lesions were of Stage I, four of the fetuses were previsible, one was decidedly premature and one gestation (17 per cent) was at term.

Of the Stage II group, three (33 per cent) of the nine had arrived at term, one was aborted therapeutically prior to irradiation, in one case there was spontaneous abortion and in the remainder (four) pregnancy was terminated early by hysterectomy. Among Stage III lesions,

TABLE II. STAGES OF CARCINOMA OF THE CERVIX

CASE	DURATION OF SYMPTOMS		TYPE AND GRADE	STAGE OF PREGNANCY, WEEKS	PREGNANCY TERMINATED BY	
	MONTHS	AVERAGE MONTHS				
Stage I						
21*	0	9.2	Adenocarcinoma	2	8	Hysterectomy
22*	18		Adenocarcinoma	1	27	Hysterectomy
17†	6		Squamous cell epithelioma	4	16	Hysterectomy
7†	7		Squamous cell epithelioma	4	6	Vaginal hysterectomy
11	12		Squamous cell epithelioma	4	Term	Vaginal delivery
26	12		Squamous cell epithelioma	4	14	Hysterectomy
Stage II						
4	1‡	6.3	Squamous cell epithelioma	3	Term	Vaginal delivery
			Adenocarcinoma			
16†	2		Squamous cell epithelioma	4	18	Hysterectomy
25	3		Squamous cell epithelioma	4	10	Hysterectomy
2	5		Squamous cell epithelioma	4	Term	Cesarean section
10	5		Squamous cell epithelioma	4	12	Hysterectomy
3†	6		Squamous cell epithelioma	3	22	Hysterectomy
5	9		Squamous cell epithelioma	—	16	Therapeutic abortion
15†	12		Adenocarcinoma	2	6	Spontaneous abortion
24	14		Squamous cell epithelioma	3	Term	Porro's cesarean operation
Stage III						
9	2	6.8	No report		Term	Porro's cesarean operation
6	6		Squamous cell epithelioma	—	Term	Vaginal delivery
14†	6		Squamous cell epithelioma	3	10	Abortion after irradiation
23	6		Squamous cell epithelioma	3	15	Abortion after irradiation
19	9		Squamous cell epithelioma	3	Term	Vaginal delivery
20	12		Squamous cell epithelioma	4	20	Hysterotomy
Stage IV						
18	2	3.3	Squamous cell epithelioma	3	Term	Vaginal delivery
1	4		No report		Term	Porro's cesarean operation
12	4		Squamous cell epithelioma	3	32	Cesarean
Miscellaneous Cases						
8	24	Stage not known§	Squamous cell epithelioma	3	18	Operation by local physician; stage 4 here 2 years later
13	12	Stage I	Myxosarcoma	3	25	Operation

*Living five or more years.

†Living ten or more years.

‡Post partum.

§Stage IV when seen here; about Stage II when seen by local physician; rapid progression.

the proportion of term to previable pregnancies increases to three and three respectively (50 per cent). Stage IV is seen to include only patients who were in far advanced pregnancy. Of the three patients, two (67 per cent) were at term and one had a gestation of seven and a half months.

The patient of Case 24, when seen at the clinic, was in Stage IV of the disease, although she was but two months post partum. She had been delivered at term by Porro-cesarean section and was believed to be in Stage II at that time. One month later, in spite of radium treatment, there was a metastatic mass in the right adnexa. This case would seem to agree with the cases in Stage IV cancer, in which the progress of the disease was very rapid and all associated with term or near term deliveries. Though the patient's symptoms are given as of fourteen months' duration in the table, a word of explanation is in order. In January, 1938, she had noted a little watery discharge on a few occasions but it did not persist. In the spring of 1938, she noticed spotting. In July of 1938, she became pregnant. During this time her only symptom was a little watery discharge at the time her menses should have occurred. On October 23, there was slight bleeding. She was examined on October 25, by a responsible physician and the cervix was clean at that time. Six months later, she was delivered at term, and was found to have a well-advanced carcinoma of the cervix.

Another patient (Case 13) had had odorous discharge and metrorrhagia for at least one year before a myxosarcoma was diagnosed. At the onset of her symptoms a year previously, she had been in the eighth month of gestation and had been told that she had cervical polyps. A few weeks after delivery these "growths" projected from the vagina. The polyps were excised once six months after the onset of the symptoms and again six months later, at which time she was again pregnant. It seems probable that the original polyps noted at the eighth month of gestation one year previous to her registration at the clinic were myxosarcoma. Certainly, when she was seen at the clinic, at which time she was in approximately the twenty-fifth week of gestation, she had large myxosarcomatous polyps which protruded from the vagina. This was only two months after the second excision of polyps which had protruded from the vagina.

Pathologic Study

A microscopic examination of tissue was made in twenty-four of the twenty-six cases, and the diagnosis of malignant neoplasm was confirmed.

Sections of tissue were available for review in twenty-two of the twenty-six cases. Two specimens (5 and 6) had dried in the course of their storage, which had been since 1916. This tissue was therefore, rendered unfit for pathologic examination. However, in both these cases, the tissue had originally been examined by Dr. W. C. MacCarty and a report of epithelioma had been made. There were no microscopic pathologic reports on Cases 1 and 9, nor was there tissue available to supply this deficiency. These last two mentioned are included in the series, however, because the clinical history and course of the disease were typical of cancer of the cervix, an unqualified diagnosis of cancer of the cervix was made by both the surgeon and the clinician and an adequate description of the lesions was given in both cases. To quote from the records, the patient in Case 1, seen in 1909, was said to have a "hard nodular carcinoma of the cervix" and the patient in Case 9, seen in 1919, had a "large fungating cancer of the cervix with hemorrhage and hard nodules palpable by rectum."

Table III shows the relation of the size of the lesion to other data. Seven patients in the group studied had lesions of medium size; that is, 2 to 4 cm. in diameter. Eighteen had large lesions of 4 cm., or more. Small lesions, less than 2 cm. in diameter, were not encountered. In Case 8 the stage and size of the lesion at time of original treatment are not known.

The proportion of medium-sized lesions is apparently not modified by a coexisting pregnancy. Among the pregnant women, 28 per cent had lesions of medium size. This figure agrees very closely with the 27.12 per cent of medium-sized lesions which one of us (Broders) found in nonpregnant women who had cervical cancer. In his study, he found that 6.47 per cent had small lesions and 66.39 per cent had large lesions. Since no small lesions were found among the pregnant group, the percentage of large lesions is therefore relatively higher (72 per cent) than in the nonpregnant group. Theoretically, one or two patients in the pregnant group should have small cervical cancers, but the number in this group is small, and a variation from the theoretical distribution is to be expected. Therefore, it would seem unwise to make any conclusions relative to the activity of the cancer due to pregnancy because such results would be without statistical significance.

In nineteen of the twenty-six neoplasms the type was known to be squamous cell epithelioma. Seventeen of the epitheliomas were graded; nine (53 per cent) were grade 4, and eight (47 per cent) were grade 3. In the series of one of us (Broders), only 34.5 per cent were grade 4 squamous cell epithelioma while 56.87 per cent were grade 3, and 8.54 per cent were grade 2. There appears to be a disproportion of high grade tumors of squamous cell epithelioma type among those who were pregnant.

Mixed adenocarcinoma and squamous cell epithelioma, grade 3, occurred once; there were two grade 2 adenocarcinomas, and one grade 1 adenocarcinoma. A case of myxosarcoma, grade 3, was also included. In two cases no tissue was available for microscopic examination.

The relation between the grade of the lesion and the extent of the cancer in this group is not outstanding. Among the medium-sized lesions there was one grade 2 adenocarcinoma, two (29 per cent) grade 3 squamous cell epitheliomas, two (33 per cent) grade 4 squamous cell epitheliomas, and one mixed grade 3 adenocarcinoma and squamous cell epithelioma. One medium-sized squamous cell epithelioma was not graded. A rather comparable distribution was found among the large-sized carcinomatous lesions; seven (50 per cent) were grade 4 squamous cell epitheliomas, five (36 per cent) grade 3 squamous cell epitheliomas and one each of grade 1 and grade 2 adenocarcinoma, and one grade 3 myxosarcoma. There were also one large ungraded squamous cell epithelioma and two large malignant lesions for which neither the type nor the grade was recorded. Similarly, there was no relation between the extent or stage of the disease and the grade of the lesion.

TABLE III. RELATION OF SIZE OF LESION TO OTHER DATA*

CASE	INTERVAL TO LAST REPORT		TRIMES- TER OF LAST REPORT	TYPE	SIZE	GRADE	TREATMENT
	LIVING	DEAD					
Stage I							
7	12 yrs.		First Term	Squamous cell epithelioma	L†	4	Vaginal hysterectomy; radium and roentgen therapy
11		2 yrs.	Second	Squamous cell epithelioma	M‡	4	Vaginal hysterectomy; radium and roentgen therapy
13		1 yr.	Second	Myxosarcoma	L	3	Total abdominal hysterectomy; radium and roentgen therapy
17	11 yrs.		Second	Squamous cell epithelioma	L	4	Total abdominal hysterectomy; radium and roentgen therapy
21§	8 yrs.		First	Adenocarcinoma	M	2	Total abdominal hysterectomy; radium and roentgen therapy
22§	5 yrs.		Second	Adenocarcinoma	L	1	Total abdominal hysterectomy (Wertheim); radium and roent- gen therapy
26	3 yrs.		Second	Squamous cell epithelioma	L	4	Wertheim's total abdominal hysterectomy; radium and roent- gen therapy
Stage II							
2		9 mos.	Term	Squamous cell epithelioma	L	4	Cesarean section; total abdominal hysterectomy
3	23 yrs.		Second Term	Squamous cell epithelioma	L	3	Total abdominal hysterectomy
4		15 mos.	Term	Squamous cell epithelioma	M	3	Vaginal hysterectomy
5		8 mos.	Second	Adenocarcinoma	M	-	Exploration; radium and roentgen therapy
10		4 mos.	First	Squamous cell epithelioma	L	4	Total abdominal hysterectomy; radium therapy
15	10 yrs.		First	Adenocarcinoma	L	2	Total abdominal hysterectomy; radium and roentgen therapy
16	11 yrs.		Second	Squamous cell epithelioma	L	4	Total abdominal hysterectomy; radium and roentgen therapy
24§	14 mos.		Term	Squamous cell epithelioma	M	3	Porro's cesarean operation; radium and roentgen therapy
25	4 yrs.		First	Squamous cell epithelioma	L	4	Wertheim's operation; radium and roentgen therapy
Stage III							
6		8 mos.	Term	Squamous cell epithelioma	L	-	Radium and roentgen therapy
9		4 mos.	Term	--	L	-	Porro's cesarean operation; radium therapy
14	11 yrs.		First	Squamous cell epithelioma	M	3	Radium and roentgen therapy
19		10 mos.	Term	Squamous cell epithelioma	L	3	Radium and roentgen therapy
20		22 mos.	Second	Squamous cell epithelioma	M	4	Hysterotomy; radium and roentgen therapy
23§		17 mo.	Second	Squamous cell epithelioma	L	3	Radium and roentgen therapy
Stage IV							
1		3 days	Term	Squamous cell epithelioma	L	-	Porro's cesarean operation and subtotal hysterectomy
12		1 wk.	Third	Squamous cell epithelioma	L	3	Porro's cesarean operation; subtotal hysterectomy; radium and roentgen therapy
18		5 mos.	Term	Squamous cell epithelioma	L	3	Radium therapy

*Case 8 not included. Stage at time of first treatment unknown.

†L = Large-sized lesion (diameter over 4 cm.).

‡M = Medium-sized lesion (diameter 2 to 4 cm.).

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One may note, however, that there are only two in six (33 per cent) of the medium-sized lesions in which the cancer was graded as 4, while in the large-sized lesions, seven in fifteen (46 per cent) were graded 4. This would suggest a relatively faster progression of the grade 4 cancer. However, in review, both grade 4 lesions of medium size had evidenced symptoms for one year, a longer period of time than the average regardless of the type of growth. A grade 4 cancer could have been expected to produce a large lesion during the course of a year.

The average duration of symptoms of large lesions caused by grade 4 cancer was 4.1 months, while a slightly shorter duration (3.6 months) was discovered in the case of grade 3 cancer.

Medium-sized lesions, whether of grade 3 or 4, gave symptoms on the average of ten months. The longer duration of symptoms coupled with a relatively smaller lesion suggests some restraining influence on the rate of tumor growth in these selected instances.

Apparently, it is not the grade alone, nor the duration of symptoms alone, that determines the rate of growth or whether a lesion shall be of large or moderate size when it is discovered.

A few words are necessary to explain Case 22. In this case, a grade 1 lesion had produced a large growth and the woman had no symptoms referable to cervical cancer at the time the tumor was discovered. It was not until one and one-half years after the malignant lesion was recognized and microscopically verified that she submitted to radical operation. The slow growth here is compatible with the low grade of malignancy. The fact that two pregnancies had supervened on the cancer does not appear to have accelerated the growth.

Two of seven patients who had moderate-sized lesions were living when the last report was received. These two have been followed more than five years; one was free of recurrence after five, and one after eleven years. A third patient, Case 11, who was apparently free of disease in her second year met accidental death. If this case is omitted, the per cent of probable cures is two in six, or 33 per cent.

Eighteen patients had large lesions, and of these, eight were living at the last report. Sixteen of these patients have been followed five years or more, and of these six, or 37.5 per cent, are living and apparently free of recurrence. Five of these patients have all lived ten years or more (twenty-three, twelve, eleven, eleven and ten years), and one has lived more than five years.

In the study by one of us (Broders) on nonpregnant women which will serve as a control, only 10 per cent of patients who had large lesions, and 33 per cent of those who had medium-sized lesions obtained good results. Among the group as a whole, 19.8 per cent were considered to have obtained a good result. Twenty-four patients in the pregnancy group have been followed five or more years, and eight (33 per cent) were free of recurrences for an average of more than

ten years. This comparison would indicate that pregnant women who had cervical carcinoma fared significantly better than those in the nonpregnant group.

It is perhaps well to mention here again the possibility of confusing a malignant lesion with the hyperplastic changes in the cervix of a pregnant woman. Clinically, the pregnant cervix may on occasion appear sufficiently abnormal to cause the examiner to suspect that a malignant lesion is present. The cervix may be coarsely granular, and the small firm excrescence may bleed on slight trauma.

Biopsy will prove the nature of the suspected tissue. A qualified pathologist should not have any difficulty in recognizing the normal pregnancy reactions of the cervix as a benign tissue phenomenon. The cells are uniform and regular and growth is orderly. Mitoses may occasionally be observed in the basal cells but pathologic mitoses are absent. The staining characteristics are typically benign. This picture is in marked contrast to that of malignancy.

One in six (17 per cent) of Stage I patients (not counting the patient who had myxosarcoma) was at term at the time the diagnosis was made. Three in nine (33 per cent) were at term with Stage II, three in six (50 per cent) at term with Stage III cancer, and two in three (67 per cent) were at term with Stage IV. It would appear from this small group that advanced pregnancy is most likely to be associated with advanced carcinoma and that the prognosis is very poor when the patient is found to be at term.

Prognosis: Effect of Type and Grade of Cancer

Five of the six patients who lived ten or more years had squamous cell epithelioma; one (Case 15) had adenocarcinoma grade 2. Two who have lived eight and five years, respectively, had adenocarcinoma grades 1 and 2, respectively. Three of the twenty-four patients who have been observed for five years or more, were found to have adenocarcinoma, and all three were living and well at the last report.

All three adenocarcinomas were in the early stage of the disease when seen, two in Stage I, and one in Stage II, although in Case 22 symptoms and diagnosis of cancer had been recognized for one and a half years before treatment, and in Case 15 symptoms were in evidence for more than a year. The relatively slow progress of the disease in the cases of adenocarcinoma is probably due to their low grades of malignancy, rather than to the fact that they were of the adenocarcinoma type.

In Case 4, the lesion was a mixed adenocarcinoma and squamous cell epithelioma, grade 3. The patient had a total vaginal hysterectomy five weeks post partum, and died fifteen months later.

In the group of seventeen cases of squamous cell epithelioma of known grade, all of the lesions were of a high grade of malignancy, grades 3 and 4, and one would, therefore, expect a relatively poor

CARCINOMA CERVIX—PREGNANCY

HOSPITAL	AGE	PREGNANT	TYPE	STAGE	GRADE	DURATION OF SYMPTOMS	TREATMENT	DURATION OF LIFE
Woman's Temple	39	5 mo.	Squamous cell	III	?	4 mo.	Radium 4,000 mc. hr.	Living and well 13 mo.
	39	5 mo.	Squamous cell	II	2	4½ mo.	High voltage therapy started	Living and well 2 mo.
	32	3½ mo.	Squamous cell	Polyp	1	2 yr.	Radium 3,000 mc. hr.	Living and well 3 yr.
	29	6 mo.	Squamous cell	II	?	4 mo.	Cautery; amputation, radium 4,400 mc. hr.	15 yr. (died of pneumonia)
University	29	2 mo.	Squamous cell	I	Transitional	3 wk.	Supravaginal hysterectomy Bilateral salpingo-oophorectomy Radium 2,400 mc. hr.	Living and well 18 yr.
	38	Term	Squamous cell	II	?	0	High voltage therapy Radium 4,500 mc. hr. Total hysterectomy	Living and well 5 yr., 5 mo.
Philadelphia General	31	2 mo.	Squamous cell	III	4	1 mo.	Radium 3,600 mc.hr., intra-uterine Radium 6,600 mc.hr., intra-vaginal	Died 2 yr., 3 mo. (from metastasis to the liver)

Five-year salvage seventy-five per cent. Seventy-one per cent lesions were in Stages I and II. Irradiation therapy used in every instance.

prognosis. It should be borne in mind, however, that among the non-gravid patients who have squamous cell epithelioma, 91.44 per cent have malignancy of grades 3 and 4.

Of the five patients suffering from squamous cell epithelioma who survived ten or more years, three had grade 4 lesions, and two had grade 3 lesions. These figures are too small to be of any statistical significance in an attempt to estimate prognosis differences between grades 3 and 4, since nine of the seventeen patients suffering from squamous cell epithelioma whose lesions were graded had grade 4, and eight had grade 3.

The one patient who had myxosarcoma met the fate common to patients suffering from this type of cervical malignant lesion. McDonald¹³ has shown that these tumors uniformly carry an extremely high mortality rate.

Prognosis by Stage of Cancer

Of six patients having Stage I carcinoma of the cervix, five were still living at the last report. One of these, however (Case 26), has been followed less than five years. The other four have been living twelve, eleven, eight and five years, respectively. The woman previously mentioned (Case 11) whose death was accidental, belongs to the Stage I group; she was apparently free of recurrence of cancer at the time of death. Thus, it is seen that in no instance in the group of six patients treated for Stage I squamous cell epithelioma or adenocarcinoma was death due to extension of the cancer. Including Case 11, the five-year cure rate of these cases of Stage I carcinoma of the cervix is 66 per cent.

In nine cases, the disease was given as Stage II. Four of the nine patients were living when the last communication was received. Eight have been followed five or more years, and of this number three were alive and well. This shows a "cure" rate of 38 per cent.

Six patients were determined to be in Stage III of their disease. Only one is known to be alive, and she is free of recurrence now in her eleventh year, a "cure" rate of 17 per cent.

As might be expected, all patients suffering from Stage IV cancer died from the disease or complications incident thereto. Two died in the postoperative period, and one because of advancing carcinoma.

Comment

The twenty-six cases studied represented 0.7 per cent of 3,570 cases of malignant neoplasm in which the patients were admitted to the clinic between 1909 and 1941. During this period, 8,500 pregnant women were given obstetric care but, since all of those whose pregnancy was complicated by cancer sought treatment primarily for the malignant condition rather than for obstetric care, the incidence of malignant lesions in this group of pregnant women cannot be estimated.

Of the entire group of twenty-six patients, in twenty-four instances a follow-up period of at least five years had elapsed in March, 1944; of these twenty-four, eight were alive and free of recurrence five or more years after the diagnosis was made, a "cure" incidence of 33 per cent.

Twenty-five of the twenty-six patients had carcinoma of the cervix and one patient had myxosarcoma. Of the twenty-five cases of carcinoma, there were nineteen cases of squamous cell epithelioma, three cases of adenocarcinoma, one case of mixed squamous cell epithelioma and adenocarcinoma, and two cases in which the type of carcinoma was not determined.

Bleeding was the primary symptom in nearly 90 per cent of the cases. Among patients in Stage I of the disease, the average duration of symptoms was nine months, as compared with three months for those in Stage IV. Grade 4 lesions were not more frequent in the more advanced cases than in the less advanced cases.

The extent or stage of the lesion corresponded in general to the duration or stage of pregnancy. Seventeen per cent of patients who had Stage I carcinoma, 33 per cent of those in Stage II, 50 per cent of those in Stage III, and 67 per cent of those in Stage IV had full-term pregnancies. Five of eight patients who lived five or more years had squamous cell epithelioma; three had adenocarcinoma. Of patients observed for five or more years, four of six patients who had Stage I carcinoma (66 per cent), three of eight patients in Stage II (38 per cent), one patient in Stage III (17 per cent), and no patients in Stage IV were alive five or more years after the malignant neoplasm of the cervix coincident with pregnancy was diagnosed.

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Discussion

DR. CHARLES A. BEHNEY, PHILADELPHIA, PA.—It is unfortunate, that in considering a subject like carcinoma of the cervix when one breaks down his series, the resultant groups are so small that it is difficult to draw any certain conclusions from the statistics. In reading Dr. Mussey's paper, I was impressed by the large total number of patients in which cancer of the cervix was complicated by pregnancy in a single institution and by the five-year salvage rate.

Through the courtesy of Dr. Margaret Sturgis of the Woman's Medical College, Dr. Thaddeus Montgomery of Temple University Medical School, Dr. Franklin L.

Payne of the University of Pennsylvania School of Medicine and Dr. Lewis C. Scheffey of Jefferson Medical College, I was able to collect 7 cases in which carcinoma of the cervix was complicated by pregnancy. In none of these institutions, including the Philadelphia General Hospital, is there any record of pregnancy complicated by sarcoma of the cervix. The material obtained from these various sources is represented in the following table, in a manner somewhat similar to Table I shown by Dr. Mussey.

In analyzing our statistics, I was surprised to find that in some of our Philadelphia institutions the complication of carcinoma of the cervix and pregnancy occurred almost as frequently as at the Mayo Clinic. For example, the incidence at Temple University is 0.7 per cent; at the University Hospital, 0.6 per cent; at the Woman's Medical College Hospital, 0.4 per cent; and at Philadelphia General Hospital, where it occurred in only two out of 1,751 cases of carcinoma of the cervix, 0.1 per cent.

The first three patients are living, less than five years after treatment. The fourth, fifth and sixth have survived for five or more years, the fourth having died of pneumonia, without evidence of recurrence of carcinoma 15 years after treatment. The last patient died two and a quarter years after treatment. Autopsy revealed liver metastases. Three of the latter 4 patients survived for five or more years, a salvage rate of 75 per cent. Every five-year survivor was treated with irradiation.

Whereas Dr. Mussey's series contains an unusually great number of adenocarcinomas, those from Philadelphia consist exclusively of squamous cell carcinomas. Unfortunately, some of our local pathologists for one reason or another, are reluctant to grade carcinoma, so that only three of our seven specimens were classified according to Broder's method. One of these was grade 4.

In evaluating statistics pertaining to the end results secured from the treatment of carcinoma, one should consider the proportion of early cases. In the Mayo group of patients, there were 60 per cent of cases in Stages I and II. The five-year salvage rate was 33 per cent. When I found that in the Philadelphia series 75 per cent of patients were living and well, five years after treatment, I was not surprised to discover that 71 per cent of these patients were in Stages I and II.

Another group of carcinoma of the cervix cases containing a large proportion of early lesions is the series from the Woman's Medical College Hospital in Philadelphia, reported by Dr. Catharine Macfarlane. I believe that as the result of Dr. Macfarlane's propaganda, her disciples and referring physicians are exceptionally alert in respect to pelvic examinations in general, and periodic examinations in particular, and that they recognize and refer to the Woman's Medical College Hospital a greater proportion of early cases than are sent to the average clinic. Obstetric patients are usually examined several times during the course of pregnancy, and it is understandable that at these periodic examinations during pregnancy, malignant lesions of the cervix are recognized before they reach an advanced stage.

One must be cautious about drawing any startling conclusions from statistics no larger than those provided by either or both of these groups. They may indicate, however, that the comparatively frequent pelvic examinations incident to proper prenatal care will disclose malignant disease of the cervix at an earlier stage than when the patient herself is left to consult a doctor after symptoms have developed. Early lesions give a high percentage of five-year cures, whether treated radiologically, surgically or by a combination of the two methods.

DR. CURTIS F. BURNAM, BALTIMORE, MD.—At The Kelly Clinic we have seen in 18 years, 13 cancers of the cervix in which pregnancy was a complication. There were 8 white women and 5 Negroes. The average age was 34 years. With one exception, they were all multipara. They were all treated by irradiation.

In three of these cases, the irradiation was given after the birth of the child. One of these three had a Porro-cesarean section, one an ordinary cesarean section, and the third a spontaneous delivery. Although bleeding had long been present in each case, none was recognized as cancer until after delivery. When first seen for the malignancy, all had bleeding and pain, and were very advanced. The children all survived; all three mothers died of cancer.

Of the remaining ten cases, one was at 2½ months, and the remaining nine between 4 months and full term. The two and a half months' patient was treated by therapeutic abortion and radiation, but the extent of the disease was too advanced to be controlled by treatment.

The remaining nine cases were treated by radiation and cesarean section when the child was viable. Of these nine cases, two were in advanced stages, one with parametrial fixation, the other with extensive vaginal involvement. Although apparently clear of cancer at the time of cesarean section, both of these mothers died of cancer—one after two years, and the other after five years.

Of the remaining seven cases, which were operable and early, five are living and free from cancer in periods from 6 to 18 years, one died of cancer after 2 years, and one is living but with an incurable cancer. This represents a five-year cure rate of 71 per cent.

As to the offspring, ten living children were obtained from nine mothers. Eight of them were normal children and two microcephalics. The microcephalics were in patients radiated at a four months' stage of pregnancy, while the normal children came from pregnancies that were further along when radiation was given. The extra child came from a mother who was treated for a very early cancer of the cervix with half the ordinary dosage. She was not sterilized at the cesarean section and a year later, came in four months pregnant, with a much more advanced cancer. This last child had severe developmental defects and died within a year, but the mother remains well after six years.

As to the histology, all were epidermoid cancers. One was classified as grade 2, one as grade 4, and eleven as grade 3. Tissue was obtained by punch biopsy in each case.

Among the five patients apparently well, three had had bleeding for about one month, one for three months, and one for five months before treatment. Among the five patients who died, one had had bleeding for less than a month, and four for more than three months.

With such a small series of cases, statistics mean little or nothing. The quip that there are two kinds of lies—white lies and statistics—is worth remembering. In going over the results of treatment of operable cancers of the cervix, when we were treating about twenty such cases a year, we found variations in five-year cure rates which in two contiguous years varied from 100 per cent to 30 per cent. The methods of examination, classification and treatment were essentially identical in these years.

Involving two lives, with various economic, family and personal angles, it is difficult to lay down hard and fast rules of procedure for the treatment of cancer of the cervix in pregnancy. Three groups may, however, be recognized.

Group One.—Patient pregnant more than four months with disease limited to the cervix. Here, radium should be used and when the child is viable a cesarean section performed. If at the time of operation everything is clear, after careful examination, approximate x-ray therapy should be given as soon as the incision is healed. If anything suggestive of disease is found and it is feasible, appropriate surgery should be performed followed by radiation with x-ray.

Group Two.—Patients observed with cancer of the cervix and with pregnancies less than four months. The hope of saving both the child and the mother should be abandoned, and treatment carried out as in a nonpregnant woman with similar involvement by the cancer.

Group Three.—Patients pregnant more than four months but with local extensive and inoperable cancer. Here, each patient must be considered from every angle, especially the likelihood of cure by treatment and the desirability of securing a normal child. I cannot lay down any general rule that I myself would follow. Every patient presents a special problem.

Before closing, may I mention that I have seen two cases, in consultation, with bleeding during pregnancy and with what, on gross examination, might have been early carcinoma of the endocervix. Biopsy showed a tissue with the pattern of a grade 1 adenocarcinoma, but without cytologically characteristic changes. These patients were not treated but watched through their pregnancies. The appearance of the cervix, after labor, returned to normal and subsequent developments showed that the condition was not neoplastic.

DR. GEORGE GRAY WARD, NEW YORK CITY.—In the Woman's Hospital, New York, during 15 years (1929 to 1943), there were 27,140 obstetric cases. During this period, we had eight cases complicated with malignancy of the cervix, seven with carcinoma and one with sarcoma. A brief abstract of these cases follows:

CASE 1.—Mrs. C. K., aged 30, pregnant 4½ months, gravida 2, para 2, squamous carcinoma of the cervix and vagina, Schmitz III, 3,600 mg. hours of radium, stillbirth 2 months later, lived 10 months.

CASE 2.—Mrs. C. P., aged 36, pregnant 5 months, gravida 8, para 2, squamous carcinoma of cervix, Schmitz III, 3,600 mg. hr. radium, stillbirth 2 weeks later, lived one year.

CASE 3.—Mrs. A. F., aged 35, pregnant 3 months, gravida 3, para 3, squamous carcinoma of cervix, Schmitz III, 4,200 mg. hr. radium, was irradiated and one month later treated by supravaginal hysterectomy and bilateral salpingo-oophorectomy. The patient was well and lived over 5 years, then died of recurrence of the carcinoma.

CASE 4.—Mrs. P., aged 35, gravida 6, para 5, 12 weeks pregnant, carcinoma of cervix, Schmitz II, was treated by high voltage x-ray followed by 4,200 mg. hr. radium, resulting in death and retention of fetus. Thirteen months later, a Wertheim operation was done, taking 2 hr. and 37 minutes and the patient died of postoperative shock.

CASE 5.—Mrs. D., aged 36, gravida 6, para 4; 6 weeks pregnant, positive A. Z. test, carcinoma of cervix, Schmitz III, was treated by 4,200 mg. hr. radium. She developed a vesicovaginal fistula, and cystoscopy showed invasion of the bladder. She had a missed abortion, lived 9 months and then died of carcinoma.

CASE 6.—Mrs. E., aged 41, gravida 5, para 4, 28 weeks pregnant, squamous carcinoma of cervix, Schmitz III, was treated by a Porro-cesarean section, with a living child. She then was given radium 3,938 mg. hr., and deep x-ray therapy. One year later, she developed stricture of the left ureter and 16 months after the Porro operation a beginning intestinal obstruction. She lived 2 years and died of recurrence of the cancer.

CASE 7.—Mrs. D., aged 26, para 1, was pregnant full term, when a polyp was found protruding from the cervix. An extraperitoneal cesarean section was done with a living child. The pathological report showed the polyp was sarcoma. The treatment was by radium 3,000 mg. hr., deep x-ray and complete hysterectomy. At her last follow-up, 8 months postoperation, the patient was well with no evidence of disease.

CASE 8.—Mrs. C. L., aged 25, gravida 5, para 2, 7½ months pregnant, squamous carcinoma of cervix, Schmitz III, was treated by Porro-cesarean section with delivery of a 4-pound, 15-ounce living girl. At operation, there was infiltration of the right broad ligament and right uterosacral ligament. A high amputation of the cervix was done with no dissection of the bladder peritoneum. Nineteen days later, 2,984 mg. hr. of radium were given and two series of deep x-ray followed, each 3,600 roentgens. The patient and child are now alive and well over 12 years with no evidence of disease.

I believe that for these cases a supravaginal hysterectomy followed by radium and x-ray is the preferred treatment at all stages of the pregnancy. In an early pregnancy, while death of the fetus from the irradiation occurs, it is frequently not expelled, or may cause hemorrhage or infection. The Porro operation, when there is a viable child, is not open to question. In the early pregnancies where there is no possibility of a living child, if a high amputation of the uterus and adnexa is done, we also get the benefit of early castration as an inhibiting factor.

DR. F. H. FALLS, CHICAGO, ILL.—One of the important points brought out by these papers and the discussion is the paucity of cases that we have for evaluation. This possibly depends on the failure to recognize the cancer during pregnancy. When these cases are first diagnosed after the pregnancy, one is inclined to forget that they were recently pregnant and hence, they appear statistically as simple cancer of the cervix.

Some years ago, Dr. Danforth reported 4 cases of cancer of the cervix in pregnancy before the Chicago Gynecological Society. Last year Dr. Fitzgerald, in the same Society reported 6 cases that had occurred at the County Hospital within two years. These cases had been immediately recognized when they began to bleed. Now, unfortunately, when bleeding occurs in a pregnant woman, a "vagina phobia" develops among obstetricians. The patients are put to bed and treated expectantly. The obstetricians do not put specula in the vagina and therefore they do not diagnose cancer. Until we change this attitude of mind and examine every woman who is bleeding during pregnancy, even if it is only a spotting, we will not discover these cases in an early stage.

Another question that came up in Chicago in connection with the cases referred to was whether to do a Porro-cesarean section or an ordinary cesarean section with the object of leaving the uterus so that x-ray and radium could better be given. There was a difference of opinion, but in most of the patients, the uterus was left in. Personally, I thought that this would result disastrously because of infection, but was surprised to find that these patients went along without developing serious infections.

DR. WILLIAM C. DANFORTH, EVANSTON, ILL.—In the report made by me some years ago, four cases of carcinoma of the cervix were discussed. In reference to the cases referred to by Dr. Falls which were discussed at the Chicago Gynecological Society, it was a notable fact that a number of these cases were seen during pregnancy, one case as early as four months, at which time a lesion was definitely seen but not recognized as carcinoma. This emphasizes a most essential point in the management of these cases. Early recognition is vital. Physical abnormalities in pregnancy require the same attention as at other times and biopsy should not be avoided. By early recognition not many opportunities for cure are lost.

As for treatment, it seems to me that when women with carcinoma of the cervix are seen at term the preferable procedure is section followed by amputation of the body of the uterus and later irradiation, both by radium and by x-ray. Women in whom the carcinoma has invaded to any degree should not be permitted to go into labor, first because of the danger of hemorrhage, second, because of the danger of extending the carcinoma by pressure, and third, because of the risk of infection.

DR. MUSSEY (closing).—Search of the literature did not reveal another case of sarcoma of the cervix complicating pregnancy, so that it was especially interesting to have Dr. Ward's comments on his case. None of the cases in our series presented themselves simply because of pregnancy. All were admitted because the cancer had been found by their family physician or else because they had developed symptoms of cancer.

We do not try to draw conclusions as to the best methods of therapy except to say that our best results have been obtained with total hysterectomy by the Wertheim method. The number of cases is too small to reach any final decision.

DEATHS IN GYNECOLOGY*

A Five-Year Analysis of 401 Fatal Cases From Charity Hospital of Louisiana at New Orleans

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(From the Department of Gynecology of the Tulane University School of Medicine)

THE late Dr. John O. Polak,¹ at the 1928 meeting of the American Gynecological Society, read a very frank and honest, and therefore very troubling, paper entitled, "What Can We Learn From a Study of Mortalities?" What he and his co-author learned was that perhaps three-fifths of the deaths which followed their own elective gynecologic surgery, as well as a number of deaths in other categories, might have been prevented by stricter adherence to the criteria which they themselves had set up to safeguard their patients and by a generally better exercise of that intangible faculty which we call surgical judgment.

I think that ever since I read that paper I have been planning to write a similar one when I were old enough in years, and when I thought I had achieved at least a minimum of professional wisdom. For the past year, I have been gathering the material which I am presenting today, and I can truthfully say that it is one of the most profitable exercises I have ever set for myself. My analysis of the 401 consecutive gynecologic deaths (Fig. 1) which occurred at Charity Hospital of Louisiana at New Orleans in the years 1937 to 1942, inclusive, was carried to completion before identification of the services on which they had been handled or of the gynecologists who had handled them. Although they occurred on all the services of the hospital, 40 per cent of all gynecologic admissions are assigned to the Tulane University School of Medicine, and the ultimate responsibility for the gynecologic service of that school is my own.

As a result of this analysis, my former pride in my own service is now tempered with a wholesome humility, and if I ever had any pride in my own personal performances, it is gone. Not a few of the cases on which I wrote "Error of judgment" or "Poor surgery" or occasionally "Gross mismanagement" proved, on identification, to be cases which I myself had either supervised or managed throughout. Whatever be the errors and failures in this series of fatalities, they are not the responsibility of any single service or any single surgeon. All of us need to confess our sins, and our confession should include the commission of things which we ought not to have done, as well as the omission of things which we ought to have done.

The series includes every death at the New Orleans Charity Hospital in the six years ending December 31, 1942, in which a gynecologic state was the primary pathologic lesion. Immediate postabortal states, al-

*Read at the Sixty-Eighth Annual Meeting of the American Gynecological Society, June 19 to 21, 1944, Hershey, Pa.

though they are often included in such studies, were excluded. I should like to make it clear that behind the statements made and the conclusions drawn, which may sometimes seem sweeping, is a great mass of statistical data. Their analysis was necessary for my purposes, but the details are not presented because I am not interested in statistics as such.

The preponderance of Negro cases in this series (Fig. 2) can be explained in a variety of ways: 1. Certain diseases, such as pelvic inflammations and uterine fibroids, are actually more frequent and are usually more severe in Negroes, who are even more inclined than white persons to neglect all illness in its early stages. 2. Negroes have not shared equally in the general prosperity which recently has reduced the number of white admissions to charitable institutions all over the

AT CHARITY HOSPITAL OF LOUISIANA AT NEW ORLEANS 1937-1942

OF EVERY 20 PATIENTS WHO DIED OF GYNECOLOGIC CAUSES



(12) DIED OF MALIGNANT DISEASE, OF WHOM



8 DIED OF CARCINOMA OF THE CERVIX ;



—AND—

(8) DIED OF BENIGN DISEASE, OF WHOM



3 DIED OF PELVIC INFLAMMATORY DISEASE, AND



3 OF UTERINE FIBROIDS.



Fig. 1.

country. Even if they had, in this community at least, they could not be cared for in the existent facilities for their race. 3. For the same reason, though this fact also explains a certain number of white hospital deaths, Negroes show disproportionate admissions to Charity Hospital for terminal care in malignant disease; they have literally nowhere else to go in their final days of life.

The age differential apparent in this series is usually noted in comparative studies of benign and malignant disease, though a breakdown of the figures would show that Negro deaths, particularly from malignant disease, tend to occur somewhat earlier than do white deaths.

An Analysis of 247 Deaths From Malignant Disease

Deaths from malignant disease make up almost two-thirds of these 401 fatalities (Fig. 3), and deaths from carcinoma of the cervix, which

numbered 167, make up well over two-thirds of the deaths from malignant disease. Eight of the 29 deaths from malignancy of the uterus were due to sarcoma, which in 6 cases originated in uterine fibroids. Fibroids were also associated with 6 cases of fundal malignancy. Incidentally, 7 of the 247 patients who died of malignant disease presented double malignancies, and an eighth patient, who seemed biologically

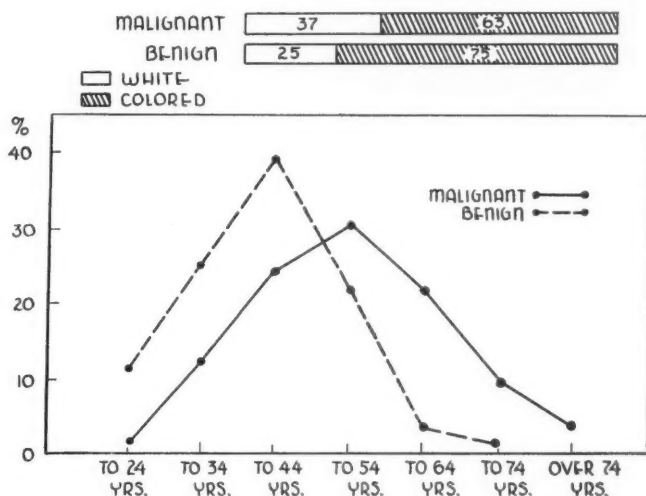


Fig. 2.—Distribution according to race and age of 401 gynecologic deaths at the New Orleans Charity Hospital 1937-1942.

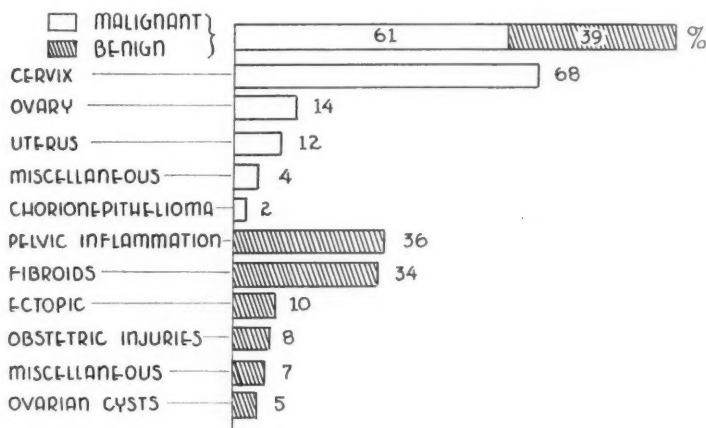


Fig. 3.—Proportionate distribution of pathologic lesions in 401 gynecologic deaths at the New Orleans Charity Hospital 1937-1942.

doomed to die of cancer, finally died of carcinoma of the vulva, after surviving operations for carcinoma of the rectum and for carcinoma of different histologic characteristics in the right and the left breast.

An analysis of these cases, and particularly of the cases of carcinoma of the cervix, emphasizes the fallacy of relying upon generalities and laws of averages and similar considerations for diagnosis. Carcinoma

and sarcoma are predominantly diseases of middle life, it is true, but 25 of the 167 deaths from carcinoma of the cervix, for instance, occurred in women under 39 years of age, and 5 of these in women under 29 years of age. Carcinoma of the cervix is overwhelmingly a disease of parous women, but in the 157 cases in which these data were available, 2 women were unmarried, 11 were sterile, and 3 had had only abortions. In 3 other instances, the confusion in which I leave to your imaginations, the onset of symptoms of cervical malignancy coincided with or followed immediately upon pregnancy or abortion.

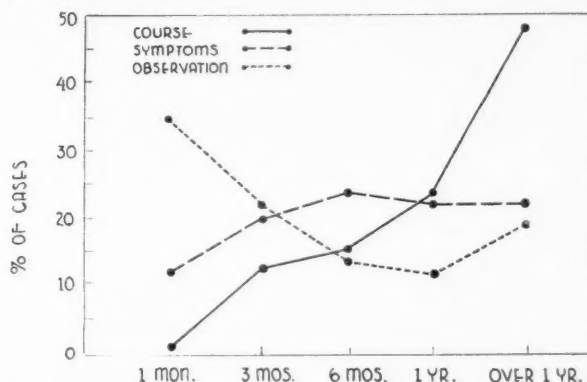


Fig. 4.—Proportionate distribution according to total course, duration of symptoms before medical consultation, and duration of observation in 247 fatal cases of various types of pelvic malignancy at the New Orleans Charity Hospital 1937-1942.

As to symptoms, it is true that a discharge, or irregular bleeding, or a combination of these symptoms is usually the first indication of the presence of most types of genital malignancy, but reliance upon them is fallacious. In these cases, diagnosis was sometimes confused and delayed because the first symptoms were pain in various locations, rectal and urinary difficulties, dyspareunia, general symptoms such as loss of weight and malaise, and bizarre symptoms such as distention, chills and fever, and fecal and urinary incontinence. The picture of ovarian malignancy was various and completely atypical. Only abdominal enlargement, which practically always indicated a fluid collection, was common to all cases, and in many instances the first symptoms were referred to the urinary or intestinal tract, or to the chest. One of the most curious features of this study was the eight cases in which a blow, a fall, or another illness (including, in one instance, extraction of teeth) from which she did not fully recover, first called the patient's attention to her genital disease. The facile statement that many of the symptoms I have listed are late symptoms is not helpful; if they are the first symptoms of which the patient is aware, that is all the worse for the patient and her chances of recovery, but they must be evaluated as such.

Many of these cases suggest that the supposedly physiologic years of the climacteric are in many respects the most dangerous period of a woman's life. Not only the patients themselves, but in most instances

the private physicians whom a few of them consulted, and in an occasional instance the hospital staff, regarded spotting and bleeding and frank hemorrhage as part of the menopause, and in some cases no pelvic examination was made for the paradoxical and incredible reason that the patient was bleeding.

Graphic presentation in these 247 fatal cases (Fig. 4) of the relative duration of illness, of symptoms before hospitalization, and of of observation shows that in a fair number the hospital cannot reasonably be charged with the responsibility for the fatalities. In carcinoma of the cervix, for instance, though the known duration of observation ranged from eight hours to something over seven years, more than two-thirds of the patients were observed less than a year, of whom 26 were under

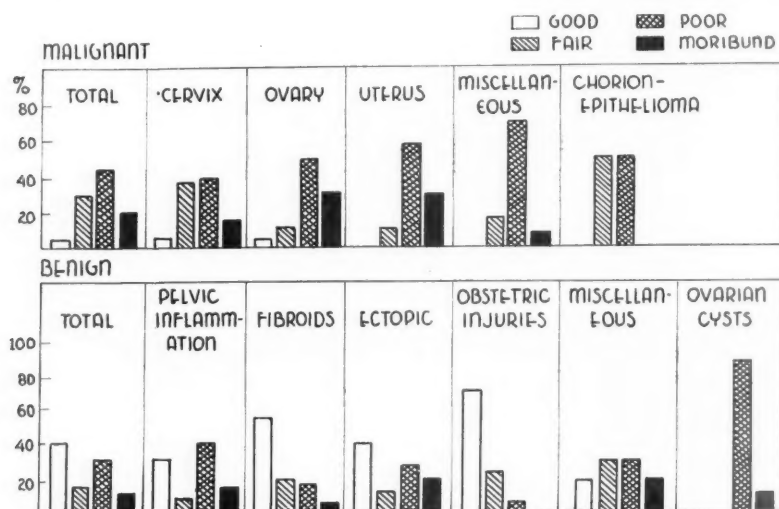


Fig. 5.—Proportionate distribution according to status of patients of 401 deaths from gynecologic causes at the New Orleans Charity Hospital 1937-1942

observation less than three months, 32 others less than a month, and 12 others less than a week. The known duration of symptoms prior to observation is equally revealing: Considerably less than half of the patients for whom these data are available sought medical advice within a year of the development of symptoms. Furthermore, what has been said of carcinoma of the cervix can be applied without much qualification to all other varieties of malignant disease.

The results of these circumstances are reflected in other cases. From the standpoint of their physical status (Fig. 5), only a small number of these patients were in good condition, and less than a third were in a fair state of health. To state the facts in reverse, 44 per cent of these patients were in poor condition and something over 20 per cent were actually moribund. In carcinoma and sarcoma of the fundus, to use a specific illustration, 17 of the 29 patients were in poor condition when they were first seen, and nine were moribund. In the 141 cases

of carcinoma of the cervix in which it was possible to determine from the records the clinical stage of the disease, 15 patients were classified as Stage I and 14 as Stage II. Being interpreted, those figures mean that approximately four-fifths of the patients who died of this disease were not in the two clinical groups in which there is any reasonable expectation of long-term salvage. There is no point to a discussion of the histologic types of cancer and their response to therapy when one is dealing with such a background as this.

The therapy of this group of cases is about what would be expected under these circumstances (Fig. 6). In the entire group of 247 patients, only 15, 6 per cent, all of them women with carcinoma of the cervix, received optimum therapy for their disease. In well over a third of all cases of malignant disease the only possible treatment was symptomatic, chiefly directed to the relief of pain and the control of hemorrhage.

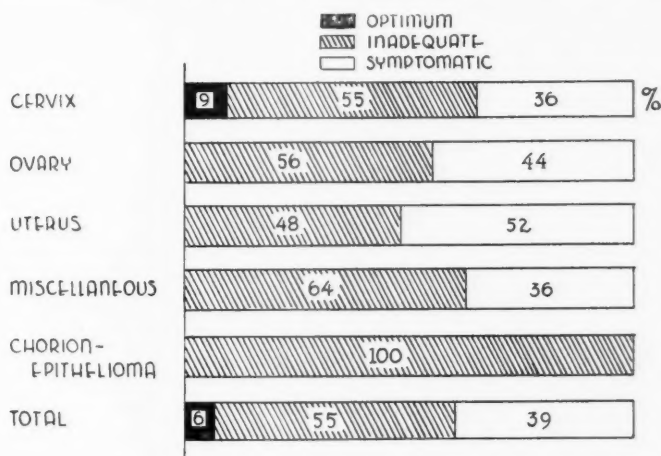


Fig. 6.—Proportionate distribution of therapeutic measures in 247 deaths from pelvic malignancy at the New Orleans Charity Hospital 1937-1942.

Under the circumstances, it would be almost a mockery to discuss ideal plans of therapy for the various types of malignant disease.

In this connection, let me say that I applaud the motive which underlies the performance of palliative surgical procedures in malignant disease, and in the occasional case I have no doubt that they are justified. But on the whole I question, when a patient has advanced to the stage at which the intestinal or urinary stream is interfered with, whether enough can usually be accomplished by such procedures to justify their performance. My own idea is that it is better to make the patient's last days comfortable with liberal sedation, supplemented by intravenous fluids if dehydration is annoying, than to add a few months to a life that is not worth living by colostomy, nephrostomy, and similar operations, the most merciful feature of which is that they sometimes precipitate the death which they were planned to delay. For the same reason, though again I appreciate the motive, I see no point whatsoever to the

use of expensive vitamin therapy, transfusion with blood which might better be saved for the living, and similar measures in patients who are dead even before they have died.

The majority of cases in which no curative therapy or in which inadequate curative therapy was applied are made up of cases in which there was delay in seeking medical advice, and in which the patients were in poor condition when they were first seen. There are, however, certain exceptions. In some cases of carcinoma of the cervix, the presence of old pelvic infections contraindicated the application of radium, and in others, the lighting up of such infections made necessary the removal of radium long before a therapeutic dose had been received.

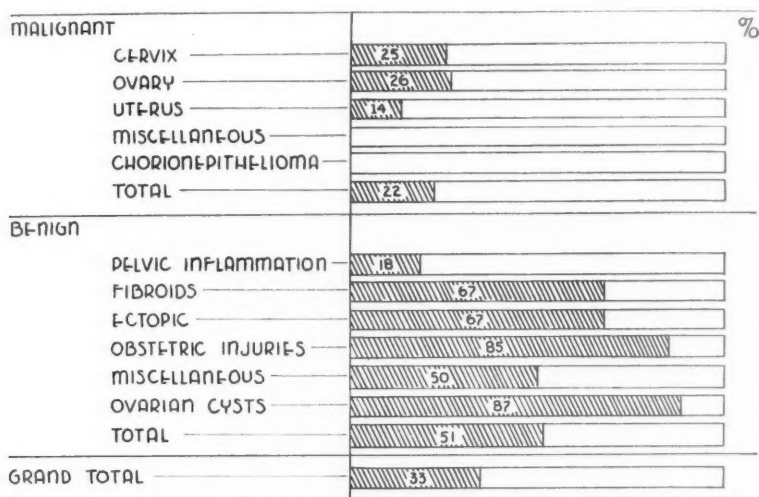


Fig. 7.—Proportionate distribution of possibly preventable deaths in 401 gynecologic fatalities at the New Orleans Charity Hospital 1937-1942.

In several instances, in all classifications of malignancy, the patients' obesity was so extreme that it was doubtful whether deep x-ray therapy were of any value at all. In a number of instances, therapeutic irradiation was well begun, but the patients improved so much that they disregarded instructions as to when to return for observation and further treatment. In a few instances they delayed for more than a year and in one or two instances they delayed for two years or more. With these lapses they signed their own death warrants.

One hesitates to make categorical statements about preventable deaths in malignant disease, but with that qualification it may be said that in a fair number of these cases (Fig. 7) a different course of action, *either inside or outside of the hospital*, might have changed the course of events.

1. For instance, 12 patients with carcinoma of the cervix had consulted physicians outside of the hospital, as had an occasional patient in the other groups and the treatment they received is a sorry

commentary on our teaching and practice. One patient, advised to have a biopsy of the cervix, left the physician who had given that excellent advice and went to a second physician, by whom she was treated medically for two years. A second patient was treated by amputation of the cervix. The other 10 patients either were treated with douches and pills and icecaps and bed rest, frequently without a pelvic examination, or were treated for such diseases—which some of them had in addition to their genital malignancy—as diabetes, hypertension, bacillary dysentery, undulant fever, and pyelitis.

2. Another group of patients, some 25 in all, were under treatment in the clinics or wards of the hospital for periods varying from a few months to several years, for medical conditions, which they actually had, chiefly syphilis and cardiovascular disease. During this time they developed their malignant disease literally under the eyes of the physicians who were treating them for their other diseases. They were either not questioned as to their menstrual habit and genital health, or their statements concerning these matters were not properly evaluated because of absorption in other conditions, and again, and all too frequently, pelvic examination was not a part of the routine of physical examination.

3. In an occasional case in which surgery is the preferred or only treatment for the special type of malignancy in question, operation was not performed, and in one or two cases in which the malignant process was possibly curable, technical errors at operation were responsible for the fatal outcome. In most cases, however, exploration proved that nothing at all could be done, and in a few instances it actually precipitated death, an outcome which no surgeon, if he can absolve himself of carelessness, can find it in his heart to regret. Incidentally, evisceration occurred in 3 of 19 cases of ovarian malignancy in which exploration was done. A number of patients with carcinoma or sarcoma of the fundus associated with uterine fibroids had been told that operation was not necessary, or had refused operation for the benign tumors; they were lost sight of, and returned with inoperable malignancy.

4. Twelve of the 167 patients with carcinoma of the cervix had been submitted to supravaginal hysterectomy from 9 months—when the malignant disease was undoubtedly already present—to 23 years before they appeared with carcinoma of the cervix. Whether or not carcinoma of the stump is favorable or unfavorable for treatment, I am not prepared to say. I am struck with the fact however, that 9 of these 12 patients were in clinical Stages III or IV; that 7 of the 12 were in poor condition or moribund when they were first seen; and that 5 of the 12 were dead within 6 months of the time they were first seen, one of them within 16 days.

I think it fair to say that in every one of these 12 cases the performance of the complete rather than of the supravaginal operation would have eliminated the site in which the malignancy developed. The argument that carcinoma of the vagina may develop after the complete operation I regard as having absolutely nothing to do with the point at issue. Nor can I subscribe to the opinion that because the complete operation in unskilled hands carries a higher mortality than the incomplete we should not advocate it. The policy of such an organization as this should surely be to proclaim standards rather than to practice expediency. On my own service at Charity Hospital we now perform the complete operation routinely in every case in which no contraindication exists, our case fatality rate is actually lower than

for the supravaginal operation, and we thus insure our patients against just such statistics as those I have cited.

5. I hesitate to say that any patient with adenocarcinoma of the ovary can be saved, for I myself have never saved such a patient. I therefore make the statement with many reservations, in view of the terrible swiftness of this disease, that in one or two instances more energetic efforts at diagnosis might have led to earlier operation. In one case in this series, by what proved a tragic error of judgment, the ovaries were resected, in an attempt to be conservative in a young woman, and the error was compounded by failure to make use of the pathologic report of malignancy until it was too late to remedy the mistake. In another case of papilloecystadenoma peritoneoscopy, which I personally regard as far more radical than exploratory laparotomy, resulted in puncture of the jejunum; prompt recognition of the accident and repair of the bowel failed to save the patient's life.

6. A bolder attack on one or two cases of carcinoma of the vulva might possibly have given the patients a chance of life which they did not have with nonsurgical measures, but I doubt it. Two of the 6 cases of chorionepithelioma were frankly mismanaged, but in each instance the disease was so far advanced that the mistakes made no difference.

7. I think it worth emphasizing, though the error was not made in any case in this series, that too much reliance upon the pathologist, whose word should usually be the court of last resort, can be misleading. In one case of chorionepithelioma, for instance, the Friedman test, though performed by all techniques including the fractional, was always negative. In some cases of carcinoma of the cervix biopsy, quite properly, was omitted. The necessary manipulations might have caused serious bleeding, and there was, above all, no justification for disturbing dying women to secure a merely academic confirmation of a diagnosis that was obvious. On the other hand, in 8 of the 126 cases in which biopsy was taken, the specimen was reported negative once, twice or several times, one specimen never being reported positive. When there are sufficient clinical grounds for the belief that the process is malignant, the institution of therapy in the absence of a laboratory diagnosis is certainly justified, and under no circumstances should such a patient be dismissed from observation, for any delay in treatment may be sufficient to seal her doom.

An Analysis of 154 Deaths From Benign Gynecologic Disease

I had believed, before I analyzed them, that the 154 deaths in this series due to benign gynecologic disease would prove very nearly 100 per cent of them to be inevitable. I was basing my opinion on the improvement in results which I have observed in my own time. In a recent study I have shown how the case fatality in pelvic inflammations has been cut in half in recent years. I knew that on my own service in 1943, there were only two deaths in 357 hysterectomies. An analysis of the individual deaths in this series, however, left me with considerably less reason for pride.

The majority of the 154 deaths (Fig. 3) were due either to pelvic inflammation (55 cases), or to uterine fibroids (53 cases). For the reasons already stated (Fig. 2), the majority of deaths in each category,

42 and 43 cases, respectively, occurred in Negro women. It is also worth noting that in the fibroid group 12 of 14 women under 34 years of age were Negroes, as were 9 of 12 women under 39 years of age.

Both of these diseases are ordinarily regarded as conditions which do not kill *per se*. It is not altogether surprising to New Orleans gynecologists, however, to find (Fig. 5) that a large number of the women with pelvic inflammation and a smaller number of the women with uterine fibroids were in poor condition, while 9 in the former and 4 in the latter group were actually moribund. Surgery may or may not be indicated in pelvic inflammations, but the condition of 12 patients with that disease was such that only symptomatic treatment was possible. Uterine fibroids is a disease in which surgery is usually the desired treatment, but 7 of these 53 women were in such condition that operation could not be considered, and in one instance the only possible procedure was simple excision of a prolapsed, sloughing submucous fibroid. Many of the Negro patients had had their growths for years, so that they had reached enormous size and had become complicated by adhesions and various forms of degeneration. Hypertension and cardiac or cardiorenal disease added to the risk in some of these cases, and obesity was a complicating factor in 9 patients, one of whom weighed more than 300 pounds.

1. On the other hand, operations for fibroids are almost never anything but elective, in the sense that there is almost always time for adequate preparation, so that a woman who is originally a poor risk can be converted into a fair one, or a woman who is only a fair risk can be made into a better one. Analysis of the individual cases in this series shows (Fig. 7) that in perhaps 37 of the 53 deaths due to fibroids, and in perhaps 10 of the 55 deaths due to pelvic inflammatory disease, the fatality might have been avoided. A study of these presumably preventable deaths revealed such avoidable errors as inadequate investigation; poor preoperative preparation or none at all; poor or delayed or inadequate or too brief postoperative therapy; lack of alertness in detecting postoperative complications in their incipency; uncorrected anemia; prolongation of the operative time beyond the limits of safety; excessive blood loss at operation; and, particularly in fibroids, a rather general tendency to underestimate the possible risk.

In the fibroid cases, to illustrate, technical errors were responsible in 4 cases for injury to the bladder, rectum or ureter. In 1 case, on my own service I regret to say, far too much surgery was undertaken at one time in a patient in poor condition. Prophylactic appendectomy was ill advised in three cases, in one of which it was done in the face of the internist's warning that the patient was a poor risk and surgery should be kept to the minimum. In at least 10 of the 16 deaths from peritonitis, and in perhaps 2 of the 6 deaths from embolism, there is a strong possibility that better treatment before and after operation might have averted the fatality. Incidentally, evisceration occurred in 4 of the 46 surgical cases in this group.

Special mention should be made of 7 surgical cases in the fibroid group, all proved by post mortem, in which the only clear cause of death was liver failure or the liver-kidney syndrome. In 6 of these,

as a review of the histories shows, hepatomegaly or other considerations indicated, at least in retrospect, the necessity for tests of liver function, which were not carried out in any instance, and for preoperative preparation directed toward the liver. It is curious that although in several instances this syndrome after operation was, on review of the cases, perfectly typical, it was not suspected in a single instance, although in most cases a systematic exclusion of other possibilities left the patients' condition a diagnostic puzzle.

2. In the group of deaths due to pelvic inflammation, the abdomen was opened in 3 cases in which colpotomy might have been wiser. Conization of the cervix, which was carried out in 1 case, is a procedure of dubious wisdom in the presence of intra-abdominal infection. Extraction of the teeth, however necessary in itself, seems to have little justification as a preoperative measure in a woman seriously ill with pelvic infection.

To me, the most astonishing finding in the cases of pelvic inflammation was that of 38 instances in this category of tubo-ovarian or other pelvic abscesses; rupture had occurred in 14, as demonstrated by autopsy, and seems to have occurred, on the basis of sound clinical evidence, in 7 others. These 21 cases are exclusive of the cases in which rupture occurred at operation, as the result of manipulation, but include 1 instance in which the rupture followed so closely upon bimanual examination that a cause and effect relationship seemed perfectly reasonable. Some of the patients were moribund on admission and apparently had suffered their ruptures some time before. In some instances, rupture occurred in the hospital, literally under the eyes of the staff. One patient, in apparently good condition, was refused admission to the hospital and directed to return for operation after bed rest at home; she suffered her rupture on the way home, and returned to the institution in deep shock two hours later. These deaths, together with certain other deaths in which surgery seems to have been postponed much too long, can fairly be classified as preventable.

3. Ectopic pregnancy was the cause of death of 15 patients, 9 of whom were not submitted to surgery. This is a truly startling situation, for of all emergency gynecologic conditions, none responds more promptly and more satisfactorily to surgical therapy than does this condition. Though some patients were in advanced stages when they were first seen, diagnostic confusion by no means explains every case. In 5 cases in which the diagnosis was made absolutely or tentatively, therapy, which should always be promptly surgical, was hesitant and long delayed. In 3 cases no donors were ever secured, and in 6 others the efforts to secure them were late and curiously languid. In a single case of full-term abdominal pregnancy, the placenta, although very adherent, was removed, with immediate furious and fatal hemorrhage.

These deaths are more to be regretted because 6 of the 15 patients were in good and 2 were in fair condition when they were first seen. It is true that 3 were moribund and 4 were in poor condition, and it is also true that rehabilitation of a patient to the point where she is out of shock is ordinarily a laudable plan of procedure. But ectopic pregnancy is one condition in which I think the contrary is true. I intend no invidious comparisons, since some of these deaths were the responsibility of my own service, when I say that I think that in most of the 15 cases I should myself have operated instantly to tie the bleeding point, letting the patient take her chances of rehabilitation later, when I think they would have been greatly improved. I make the statement the more

emphatically, for in 2 patients who were moribund, I, myself, operated under such circumstances, and in each instance witnessed prompt and dramatic recovery.

4. Thirteen patients died whose basic pathology was obstetric injuries, which in 8 cases took the form of prolapsus uteri. This small group of cases is worth analyzing in some detail, for in 12 cases the operations were entirely elective, and the status of the patients was good or fair in all but one instance. In other words, the circumstances in this group were chiefly favorable.

In some 11 of these 13 cases the records suggest that the fatal outcome might have been avoided. For instance, a 31-year-old patient was submitted to vaginal hysterectomy when at her age a less radical procedure would probably have corrected her displacement. A stocky, obese woman, with first-degree prolapse and very short ligaments, was submitted to vaginal hysterectomy when the abdominal route would have been simpler and safer. In 4 instances technical errors were made at operation, in one of which, through a tragic mischance, a ureter was tied. When the abdomen was finally reopened, it was found that the other ureter was blocked by the extension of a then unsuspected carcinoma of the pancreas; incidentally, that finding clarified a number of symptoms which had simply been disregarded in the work-up of the case.

In this same group investigation after operation, when an obscure complication developed, revealed a past history suggestive of a central nervous system lesion; I doubt that this patient should ever have been operated on. Several patients might have been benefited by preoperative preparation, of which they had none, and several others by more preparation than they had, including the correction of a hemoglobin deficiency of 50 per cent. In 6 cases, one of which was another instance of apparent liver death, postoperative care was not entirely adequate.

It is evident, I think, from what has been said that more alertness and less complacency on our part might have saved most of these patients. I make the statement with deep regret, for 5 of the 8 cases of uterine prolapse occurred on the Tulane service on which—hitherto, at least—we have rather prided ourselves on our results with vaginal hysterectomy.

5. Of the 8 patients with various types of benign ovarian tumors, prompter investigation and more alert and more adequate preoperative care might have saved perhaps 7. One patient with pseudomucinous cystadenoma was refused immediate admission because of an influenza epidemic; she returned five years later, and in the 26 months before her death, 96½ gallons of fluid were removed from her by repeated paracentesis.

6. I am inclined to believe that perhaps 5 of the 10 remaining cases, in which the diagnoses included tuberculous peritonitis, pyometrium, uterine polyp, and endometritis, might have been saved by a wiser choice of procedure and more attention to preoperative and postoperative care. It is only fair to point out, however, that 3 of the patients in this group were in poor condition when they were first seen, and that 2 others were moribund and died within 48 hours.

Comment and Conclusions

The general impression received from a study of these 401 deaths is that, on the whole, the cases were well managed from the standpoint of the hospital, and that in the great majority of cases, particularly

the malignancies, and after making due allowance for the speed and general hopelessness of such conditions as adenocarcinoma of the ovary, the patients were responsible for their own deaths. On the other hand, in perhaps 25 per cent of the deaths from malignant disease the patients might have been given a chance of life, and in perhaps half of the deaths from benign disease the outcome might have been different, if the plan of management *outside as well as inside of the hospital* had been different in some or in all respects.

1. Histories should be taken with much more care from every standpoint. In several instances in this series detailed knowledge of past episodes of cardiac, renal and other diseases would have meant re-evaluation of the operative risk, and in a few instances treatment by non-surgical measures.

2. There should be less complacency about the risk in both uterine fibroids and pelvic inflammations. In both diseases the case fatality rate is now gratifyingly low, but only such an analysis as this reveals that a low case fatality rate does not mean that all of the patients who died could not have been saved. Neither disease is always as simple as it seems. In this series, the responsibility for the cases in which there was an unwise estimation of the risk was about equally divided between the surgeon and the medical consultant. The medical consultant sometimes seemed rather too optimistic about the patient's status, and the surgeon, for the same reason, sometimes disregarded the consultant's warning as to the duration of operation and the type of anesthesia.

3. In all surgical cases there could well be a more careful evaluation of the need for preoperative therapy, even when the patients seem fair risks and present only minimal deviations from the normal. Blood surveys should be carried out in all cases, and mild degrees of anemia, hypoproteinemia, urinary tract disease, and hepatic dysfunction should be investigated and corrected as necessary, since minimal deviations from the normal tend to become maximal if unexpected technical difficulties develop, or if unusual blood loss occurs at operation. General measures, including a period of bed rest in hospital before operation, will usually convert a fair risk patient, who presents no tangible deficiencies, into a better risk.

4. There should be more alertness after operation to detect possible complications in their incipency, more speed in instituting treatment when such complications are discovered, and a quicker resort to such measures as intestinal decompression, infusion, transfusion, and oxygen therapy when it is evident that less active measures are not achieving results. Such measures, furthermore, should be continued until it is clear that improvement has occurred and should not be discontinued when it is merely hoped that it is occurring. Particularly to be guarded against is too early a return to oral feeding in ileus and peritonitis.

5. More discretion should be employed in discharging patients in certain categories without adequate provision to bring them back if they do not return voluntarily as directed. A fair number of women with malignant disease in this series signed their own death warrants because, when they improved after irradiation which was well begun, they failed to return for more. Patients with pelvic inflammations who improved under bed rest often delayed likewise, and finally returned in much worse condition than when they were discharged to cool at home. Particular inquiry should be made as to whether women discharged for this purpose must reach home by long train or bus or automobile rides; in this group of deaths are 2 cases in which rapid deterioration of the patients' condition occurred under such circumstances.

Some plan should also be devised for following women with uterine fibroids in whom operation has been deferred or has been refused by the patients themselves, so that it can be done without delay if there is a change in either symptoms or physical findings.

6. Certain cases in this series suggest that the conservative therapy of pelvic inflammations should be hedged with more reservations and safeguards. Patients with obvious abscesses, in which the proportion of rupture was startlingly high, should be kept under observation in the hospital and should be operated on promptly when maximum improvement is evident, or when it is clear that no further improvement can be expected.

7. A more general use of total hysterectomy would automatically prevent the development of a certain proportion of cases of malignancy of the cervix.

8. It should never be forgotten that a patient with one disease, even if that disease is malignant, may have or may develop another disease, including another malignant disease, at the same time. Therefore, the menstrual habit of all women hospitalized or coming under observation for any cause should be inquired into, and the information thus obtained should be carefully evaluated. Pelvic examination should be made a routine part of all physical examinations in certain periods of life, and should never be omitted at any period if genital abnormalities of any kind are revealed by the history. Much closer cooperation between the various staffs of the hospital and between general practitioners and specialists is necessary to accomplish these purposes.

9. A much higher "index of suspicion" of malignant disease, and especially of malignancy of the cervix, must be ingrained in medical students, interns and residents. I had thought that my own students had been thoroughly indoctrinated in this respect. It was rather shocking to find that they had not been. Interns and residents whom I know personally to have been well trained at schools other than Tulane were equally culpable. They failed to suspect malignancy instantly on the basis of what seemed clear-cut histories and physical findings, or they failed to list it as the first of a group of diagnostic possibilities to be ex-

cluded. The fact that in most instances in this series their diagnostic lack of suspicion made no difference does not in the least alter our responsibility as to how these men are taught.

10. Interns and residents in particular must be imbued with the belief that not all instances of malignant disease are hopeless, an idea which a surprising number of them now seem to possess, and which results in an eager desire to clear the wards of such cases and to use the beds for other purposes. They must be further impressed with the idea that much can be done for the comfort of such patients, even when cure is not to be expected. On the other hand, when it is evident that they will merely prolong a life that is not worth living, transfusions, vitamin therapy and similar measures should be promptly discontinued. For the same reasons, most palliative surgical procedures have a very limited field of usefulness.

11. For frank errors of diagnosis and treatment we are, of course, responsible as individuals, and most of the preventable deaths from benign disease in this series fall into that classification. But hospital errors do not account for more than a small percentage of the possibly preventable deaths from various types of pelvic malignancy in this series. How much responsibility shall we assume for the great body of patients with pelvic malignancy who fail to seek medical aid until it is too late to help them? Personally, I think we shall have to assume a large share, and we shall have to meet it by an improvement in our teaching methods, such as has already been outlined, and by an even greater improvement in our propaganda methods, which at present are clearly ineffective.

As many of these cases show, the menopausal years are a period of particular danger in a woman's life because of the possible confusion between the expected irregularities of those years and the early symptoms of malignancy of the cervix. The solution would seem to lie in teaching women to submit to pelvic examination at regular intervals, whether or not they present symptoms. If proof of that policy were needed, Macfarlane and her associates in Philadelphia² have recently provided it. The criticism that they found only 4 malignancies of the cervix in their first 955 pelvic examinations, all of which were carried out on women in whom there was no reason to suspect malignancy, or that they found no instances of malignancy in their next thousand-odd examinations, is no criticism at all. The point is that by routine examination of all women willing to be examined, Dr. Macfarlane and her associates found 4 early malignancies of the cervix which otherwise would probably not have been found until later. It is not too much to say that those 4 women owe their lives to this courageous group of physicians. The plan that they are putting into practice seems the simplest, and indeed the only practical, way to improve the present disastrous results in genital malignancy, and more of us would do well to employ it.

Another form of propaganda is also necessary. Physicians as well as patients must be taught the potentialities for danger in vaginal discharges and menstrual irregularities. Physicians, including gynecologists, should be taught to welcome the opportunities to make routine examinations, in the absence of symptoms, rather than to discourage them, as has been done in more than one instance of which I have knowledge. At the present time, gynecologists seldom see these women until their symptoms are clear-cut and their disease is correspondingly advanced. Their family physicians see them first.

I know of no more effective, and at the same time no sadder, way to conclude this paper, in which my only aim has been to point the road to improvement, than with the statement that with one single exception, every patient in this series with malignant disease who had consulted a physician before she came to the hospital received advice that was lethal. It is one of life's ironies that the single patient who was advised to submit to biopsy declined the investigation and went to a second physician, by whom her carcinoma of the cervix was treated by medical measures for almost two years.

Summary

An analysis of 401 consecutive deaths from gynecologic causes, two-thirds of which were due to malignant disease, has been presented from the standpoint of how many were positively or possibly preventable. The various considerations by which some of these fatalities might have been prevented are discussed.

References

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Discussion

DR. NORMAN F. MILLER, Ann Arbor, Mich.—It is illuminating and helpful to hear something about the bad as well as the good results in the management of our cases. Today, we have been fortunate enough to have two papers which fall into this category. This morning Dr. Huber told us about the deaths in his eclampsia cases, and this evening Dr. Miller tells us about deaths occurring on his gynecologic service. It takes courage to tell about bad results and both of the speakers should be congratulated on their frankness.

One of the outstanding things about Dr. Miller's paper is the fact that it shows us again that our number one problem in gynecology is cancer. Sixty per cent of the deaths among his patients were in this category. The fact that so many cases were far advanced is a characteristic finding for all cancer clinics, and it emphasizes once more that whether we like it or not, we still have a very important educational problem before us. Sometimes educational endeavors for the laity seem decidedly fruitless, but though progress is slow, we must not let down in our efforts.

Dr. Miller makes a rather surprising statement to the effect that to his knowledge, he has never cured a case of ovarian adenocarcinoma. Certainly such a statement emphasizes the seriousness of that disease and also points to the value and help that might accrue to women through periodic health examinations.

Another point of interest is the report of 12 deaths due to cervical stump carcinoma. I think we all agree that in patients requiring hysterectomy, total hysterectomy is the operation of choice provided there be no contraindication to complete extirpation.

I was also surprised to learn that there were 15 deaths from ectopic pregnancy, 9 of three patients had not been operated upon. Recently, I discovered that some of the best men in my own state favored expectant treatment of ectopic pregnancy. In our experience, delay is seldom justified.

I am sure we can support Dr. Miller in his conclusion wherein he states that greater attention to preoperative examination and preoperative preparation of the patient is to be repeatedly emphasized. No patient will object to such care when she realizes that these additional measures are being undertaken for her safety.

DR. CATHARINE MACFARLANE, Philadelphia, Pa. (by invitation).—Dr. Miller mentioned the research on the control of cancer of the uterus which is being conducted at the Woman's Medical College of Pennsylvania. In this connection I should like to report that of the original group of 1,319 volunteers, 550 have completed the five-year period of examinations.

Three early cancers of the uterus were discovered in the first round of examinations. These volunteers were treated with radium and are well five and six years after treatment. A fourth early cancer was discovered on the tenth visit of another volunteer. This lady was treated with radium and is well 15 months after treatment.

The discovery of these four early cancers in presumably well women furnishes an argument in favor of periodic pelvic examinations.

DR. THADDEUS L. MONTGOMERY, Philadelphia, Pa.—The discouraging results which Dr. Miller refers to in the field of gynecologic cancer lead quite logically to the questions, first, of the role of periodic gynecologic examinations in the prevention of disease or its early recognition, and second, to the matter of better education of our medical students and young doctors in gynecologic diagnosis.

While I cannot judge, of course, how widespread the influence of Dr. Catharine Macfarlane's campaign for regular examination has been throughout the country, I can say that in Philadelphia, women are conscious of the importance of periodic health examination. If the doctor does not of himself recommend it, they ask for it. For this enlightened state of mind in our home city, I believe that Dr. Macfarlane is largely responsible.

As a result of this newer development in gynecology, 20 to 30 per cent of our office work is now made up of semiannual and annual gynecologic examinations. I can foresee the time not far distant when this phase of activity, properly encouraged, will constitute the majority of our office work. The time has arrived when no obstetric patient, no new gynecologic subject, and no postoperative patient should be discharged without the recommendation of a semiannual checkup. If every practicing obstetrician and gynecologist would, upon these occasions, avail himself of the opportunity of spreading this bit of lifesaving propaganda, the word would soon get about to all the women of the country.

The second proposition is the better training of our medical students and young physicians in the early recognition of the common and serious gynecologic diseases. For this there is now some hope. The young doctor is "cancer conscious" and the divisions of gynecology in the various medical schools of the country are doing a much better job of instruction than formerly. Most of such departments have given up their former undertaking to make gynecologic surgeons out of the fourth-year medical students and are devoting their teaching hours much more profitably to methods of diagnosis and office treatment. The significance of irregular vaginal bleeding is emphasized over and over again.

AN ANALYSIS OF 101 FATALITIES FROM ECTOPIC PREGNANCY*

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(From the Committee on Maternal Welfare, Philadelphia County Medical Society)

IN THE decade, 1931 to 1940, which was characterized by a nationwide activity in maternal welfare, the incidence of deaths from ectopic gestation to total puerperal deaths in Philadelphia was 5.7 per cent, in New York 6.3 per cent, and in Chicago, 8.1 per cent. Expressing the figures in another manner, every eighteenth puerperal death in Philadelphia, every sixteenth puerperal death in New York and every twelfth puerperal death in Chicago during this period was due to ectopic gestation.

In Philadelphia among 2,204 ectopic gestations recorded by the hospital record librarians and the Coroner's office, from 1931 to 1943 inclusive, there were 101 deaths, a mortality of 4.6 per cent.

Coincident with the reduction in the maternal mortality rate locally during these years, there has been a definite improvement in the management of ectopic gestation. Sixty-two of the deaths reported occurred during the first six years of this study and 39 during the next seven years. The mortality per number of ectopics reported in the first six years was 5.6 per cent, and for the next seven-year period only 3.5 per cent. In the last two years the rate was 2.2 per cent.

Since 1931, the Committee on Maternal Welfare of the County Medical Society has analyzed individually every maternal death in Philadelphia. When the number of ectopic gestation deaths, 1931 to 1943, reached 101, it was felt an analysis of the histories might prove of value. The following factors were considered in this analysis:

Age.—Thirty-eight deaths, the largest number in a single age group, occurred from 30 to 34 years. The percentage of these deaths to the entire series, approximately 38, is double the distribution of total births, 19 per cent in the same age group over a twelve-year period in the city. Twenty-four per cent of the deaths occurred in the age group, 25 to 29 years, the group in which 30 per cent of the total births occurred. It is probable that the increased incidence in the ages 30 to 34 years may reflect repeated pelvic assaults of pregnancy, abortion or infection.

Race.—Thirty-eight per cent of the ectopic gestation deaths occurred among Negro women. Approximately fifteen per cent of the total births in the twelve-year period occurred among Negro women. Ectopic gestation to total puerperal deaths in the Negroes was 9 per

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cent, just twice the ratio in white puerperal deaths. These contrasting percentages may be due to a greater incidence of pelvic infection in the Negro race.

Parity.—In the women whose parity was known, 30 per cent of the series had not been pregnant before. Of the remainder, 16 per cent had had one previous pregnancy, and 23 per cent two previous pregnancies.

Present History.—A history in this study of ectopic gestation has been regarded as typical if there was amenorrhea associated with vaginal bleeding and abdominal pain. There were 30 cases where such a history was obtained.

In 49 instances such a typical triad of symptoms was less well defined. We have regarded as a suggestive history one which may or may not have included absences of menstruation, but where low abdominal pain and vaginal bleeding were present and should have helped toward a true diagnosis.

Misleading, chiefly falsified, histories were present in 12 cases, particularly where attempts at criminal abortion had been made, or where the patient was unmarried.

In ten cases, no history at all was obtained. It should be remarked that in our maternal mortality study in Philadelphia not only are the hospital records available, but interviews by the recorder of the Committee are had with local physicians and the family. In many instances, the statements of the family to the Coroner's office have given us the history of the case.

We have stated in discussing parity that seventy per cent of the women in this series had been delivered of one or more children. In this group, there were 20 who gave a history of one or more abortions, and six admitted one or more criminal abortions. There was a history of one previous ectopic gestation in the series. Eleven of the women had had previous pelvic operations. A definite history of previous pelvic infection was noted in eight other records. This is probably a lower incidence of pelvic infection than is actually correct, for histories were not obtained in all cases, and in some, the review may have been sketchy due to the emergency of the admission.

Amenorrhea.—That a history of amenorrhea is not always present, is witnessed by finding seventeen women in this series who had not missed a period. A fatal ectopic pregnancy occurred in a lactating woman. Thirty-eight women had missed one menstrual period, twenty-four had missed two periods, twelve had missed three or more. No history was available in nine women. Possibly one-third of this series might have been saved if they had sought adequate medical care, and had had pelvic examinations, at least, at the time of the second missed menstrual period.

Symptoms.—Vaginal bleeding and pain were almost equally distributed as initial symptoms. After the appearance of such symptoms, there was an excessive delay on the part of the woman in seeking medical aid in 58 per cent. Forty-two per cent sought medical advice within twenty-four hours of the initial symptom, seventeen per cent in 12 hours or less, twenty-five per cent within 12 to 24 hours. It is significant that these two symptoms, especially when associated with amenorrhea during childbearing period, are regarded so lightly by the laity. In all health instruction to women the gravity of this group of symptoms should be stressed.

Diagnosis.—The history was sufficiently typical in 13 cases that a diagnosis of ectopic pregnancy was made on it alone. In twelve cases, the diagnosis was made on pelvic findings, while in 19 cases diagnosis was based on both history and pelvic findings. In but one instance was a biologic test for pregnancy made. This was in a woman acutely ill with thyroid disease. Thus, in nearly half the cases a correct diagnosis was made before operation.

In twenty-one cases the true nature of the lesion was not accurately determined until operation. The incorrect diagnoses include six cases diagnosed as pelvic abscess or inflammatory disease, three as threatened or incomplete abortion, three as myoma, two as ovarian cyst and one each as acute appendicitis, acute abdomen, intestinal obstruction, uterine rupture and uterine perforation from intrauterine contraceptive stem pessary. In two cases laparotomy was performed because shock developed during observation. In six of these cases, the history was typical and each woman had a pelvic examination. Six of the women were not examined, and four gave a misleading history. In the remainder the histories were suggestive and pelvic examinations were made.

Diagnosis was not made until autopsy in 36 cases. Four cases were not operated on although the diagnosis was suspected in two who were badly shocked on admission, and in two cases where pneumonia was present and was judged to preclude operation. Most of these cases represent women not seen by a physician, or who refused hospitalization, or where the first attendant missed the diagnosis. Sixteen of these had typical or suggestive histories. Only twelve had pelvic examinations. A diagnosis of abortion was made in 6, pelvic inflammatory disease in five, and one each, tuberculous peritonitis, intestinal obstruction, anemia, benign uterine bleeding and retroversion.

Although many of these women gave strongly suggestive histories or had pelvic examinations, the index of suspicion of ectopic gestation was not high enough to lead the medical attendants to a correct diagnosis. Where pelvic examination was not made, the omission was almost equally due to the patient not seeking medical care until shock was present, or to an unexplained oversight on the part of the family physician or member of the hospital staff. In a few cases, an incorrect diagnosis led to omitting the pelvic examination.

Hospitalization.—It is relevant to this analysis to determine the interval from the first medical advice to hospitalization. It is on record that eighty-two women were seen at their homes by physicians. Of these, seven did not enter hospitals. In the others, it was recognized that hospitalization was necessary and 54, or 72 per cent, were referred for admission within 24 hours. Yet, in only 9 instances was the situation regarded as sufficiently serious that admission was obtained within six hours. Twenty-one cases were admitted to hospitals later than 24 hours after first being seen by a physician. Of these, 15 were not referred for 7 days or longer. Six women applied for hospital admission on their own initiative. The records of the remaining cases were unsatisfactory on this point.

It must be apparent that the true state of the condition for which medical aid was sought, and its acute emergency nature was largely overlooked by the family physician who first saw these cases.

Of the twelve women who were not admitted to a hospital, seven were seen by a physician. In five, the diagnosis was completely missed. In

two cases, medical advice as to hospitalization was refused. Five patients had no medical care whatever, and were reported to the Committee after autopsy by the staff of the Coroner's office.

Time of Operation.—There were 25 women admitted to the hospital who were not operated on. Two patients died immediately after admission, another was too greatly shocked and died within an hour, two had pneumonia. In nine, no diagnosis was made and the patients died while under observation. In eleven other cases, a presumptive, albeit incorrect, diagnosis was made. In four cases the condition was diagnosed septic abortion, in four pelvic inflammatory diseases, and one each as tuberculous peritonitis anemia, and retroversion.

Eighteen of the women admitted to hospital were not operated on until more than 24 hours after admission. Four were correctly diagnosed, while four were regarded on admission as abortion, threatened, or incomplete, three as myoma, two as pelvic abscess, and one each as thyroid disease, anemia, intestinal obstruction, ovarian cyst and shock. The last case was actively treated during this preoperative period.

In fourteen women the operation was delayed until within the second twelve hours after admission. One was regarded on admission as acute appendicitis, two as fibroids, fourth as an uterine hemorrhage. This patient had a cauterization of the cervix as a preliminary to an elective hysterectomy proposed for four days later. In three cases admitted at night, the operations were held up for elective surgery by the attending chief the following morning. In the remainder, the appearance of pronounced shock prompted a correct diagnosis.

In twelve cases, operations were performed more than two hours after admission, but, under 12 hours. In four instances, operation was delayed to treat evident shock, in the other eight, there was a delay in naming a correct diagnosis.

Twenty-one women were operated on within two hours after admission. On thirteen of the records it was stated that the patients were in shock. Only six of these patients were transfused. Two had transfusions during operation, four postoperatively and two had both types. The deaths in this group were ascribed to hemorrhage and shock in thirteen, peritonitis in four, embolus in two, intestinal obstruction in one and transfusion reaction in one.

It is evident that error or delay in making correct diagnosis was responsible for death of a large proportion of the women who were operated upon.

Operative Risk.—Twenty-one women, of the 65 operated on, were considered good operable risks. This decision was either stated on the hospital record, or has been based on the record of a normal blood pressure associated with a hemoglobin and erythrocyte count that did not reflect a marked degree of hemorrhage. Death was found to have occurred from peritonitis ten times. In eight of the infection deaths multiple operations had been performed, these included five appendectomies. In the remainder, the conclusion was drawn that an error in technique had occurred. Five women died from hemorrhage. In four cases there was either too much surgery or inadequate surgery, the fifth probably died of secondary hemorrhage. Three women died of pulmonary embolus, in one case the convalescence had been afebrile, in the other two a suspicion of infection had to be entertained. Three patients died of medical complications.

Nine women were operated on in whom the risk was regarded as fair by the attending surgeon, or could be so designated by the clinical and laboratory findings on the record. Three women died of infection. Multiple or inadequate surgery was regarded as causative in two of these cases. Five patients died of hemorrhage. Three of these had multiple operations or inadequate surgery. One patient died of a pre-existing renal infection.

Thirty-five women were operated on in shock. The paucity of transfusions during operation and immediately afterward undoubtedly accelerated the fatal termination. There were 26 deaths from hemorrhage. Prolongation of hemorrhage was caused seven times by delay of patient in seeking medical aid, or refusing hospitalization, or giving a misleading history. In sixteen cases the delay was evidently the fault of the family physician, or of the hospital staff in diagnosis, or in inexplicable delay in operating, or performing inadequate or multiple surgery.

Where operation was prompt and transfusions given during and after operation, the deaths were regarded as nonpreventable. One patient died of a transfusion reaction, another of hemiplegia and a renal shutdown. Seven women survived operation in shock to die later of infection. In all instances this was regarded as due to an error in technique.

Time of Death After Operation.—The efficiency of surgical and related therapy as well as the patient's capacity and ability to withstand hemorrhage, surgery and present or introduced infection is reflected in the length of time these women survived operation.

So we find three women died during operation, and nineteen women died within twenty-four hours after operation, all of shock and hemorrhage. Eleven of these deaths occurred within six hours. Only three of these patients received transfusions.

Seven women died in the second twenty-four hours after operation, three of shock and hemorrhage, four of infection, peritonitis. Only one transfusion was recorded in this group. In one woman, pneumonia was present in addition to the fatal peritonitis.

During the third, fourth, fifth and six days after operation the deaths numbered 18, of these, seven were due to hemorrhage, seven to infection, and four died as a result of the following added complications: transfusion reaction, left hemiplegia, and renal cortical necrosis, thyrotoxicosis, and congestive heart failure in a patient with known rheumatic heart disease.

On the seventh postoperative day, 18 deaths occurred. Twelve were deaths from infection, two from secondary hemorrhage, and four from added complications, one kidney lesion and three pulmonary emboli or infarcts, in two of which the postoperative convalescence had been afebrile.

Multiple Operations.—Among the deaths, there were 18 cases in which multiple operations were performed. These ranged upward to a series, in one woman, of dilatation and curettage, tracheolorrhaphy, hemorrhoidectomy, multiple myomectomy and bilateral salping-oophorectomy. The preoperative diagnosis here included possibility of bilateral ectopic pregnancy.

In nine cases where plastic operations or herniorrhaphies were done before the abdomen was opened, ectopic gestation had been diagnosed three times.

In ten cases, in addition to excising the affected tube, such other operations within the peritoneal cavity as appendectomy, myomectomy,

hysterectomy, defundectomy, suspension of the uterus and removal of the opposite tube and ovary were performed. It is noteworthy that in four of the five cases where the appendix was removed, death was caused by infection.

In the majority of these instances, the decision of the Committee assigning responsibility to the operating surgeon was based upon error in judgment in the performance of what was regarded as nonessential surgery in the presence of an acutely life-threatening situation, in addition to failure in diagnoses.

Incomplete Operations.—In addition to the five operations performed on ruptured cornual pregnancies, which were largely regarded by the Committee as inadequate surgery, there were eight cases in which the surgical treatment was considered incomplete. Four times this opinion was based upon the performance of a curettage or colpotomy, singly or combined without further treatment of the intraperitoneal lesion. In another instance, a two months' fetus was removed from the cul-de-sac and the pelvis drained. Again, the bleeding point on a tube was ligated, the tube not removed. In another the excised tube was reported by the pathologist not to have been the site of a pregnancy. In one case the tube was ligated on both sides of a perforation, the tube was not removed.

In the entire group the attending surgeon was regarded as responsible by the Committee, the avoidable factor being error in judgment.

Cornual Pregnancies.—There were eight deaths from cornual pregnancies in the series, five occurred in multiparas. In five, the pregnancy was advanced to the third month. Three died unoperated upon, two because of extreme shock, one because a receiving ward intern missed the diagnosis and the patient died after being sent home. In this instance, the enlarged tender cornua had been noted in prenatal clinic and diagnosed as subserous myoma.

In the five operations the cornual rupture was closed by suture; with removal of the adjacent tube and ovary in two, and with wedge shaped resection of the cornua in one case. The latter was the only one in which death did not occur within 24 hours. In this instance the patient, transfused during and after operation, developed sepsis. Some of these deaths might have been prevented had hysterectomy been performed.

Secondary Abdominal Pregnancies.—There were five deaths in which the ectopic gestations were secondary abdominal pregnancies.

In one the diagnosis was made by chance in a woman dying of pneumonia. At death, an immediate abdominal incision was made preparatory to a postmortem cesarean section. The fetus, dead and slightly macerated, but 7½ months' development, was found in a sac originating between the layers of the broad ligament. The patient had had constant prenatal care during her pregnancy.

In the second case, a primigravida with no prenatal care or examination, shock developed at the fourth month. At delayed operation, with the patient septic, the fetus was removed and the placenta left in situ on the broad ligament with packing and drainage. Septic death occurred on the third postoperative day.

The third case gave a history of missed abortion two years previously. There had been many pelvic examinations; with a diagnosis of multiple myoma, a hysterectomy was scheduled. A right broad ligament pregnancy with a six months' lithopedion was found and pelvic débridement performed. Death from secondary hemorrhage occurred on the fifth postoperative day.

The fourth case was under prenatal care until the eighth month. Abdominal pain was regarded as due to a ruptured uterus. Operation in shock revealed a secondary abdominal pregnancy, with death following on the operating table.

The fifth case was a three months' pregnancy attached to the sigmoid and parietal peritoneum. Patient had no previous care, was admitted in shock and promptly operated on. Transfusion was followed by acute hemolytic reaction, anuria and death.

Attempted Abortion.—Attempts at illegal interruption of pregnancy had been made in ten of the cases in this series, nine times by the patient and once by a physician. Misleading histories were the rule. Operation was performed in six cases. In two, however, the true diagnosis was revealed by laparotomy, subsequent to colpotomy done for suspected pelvic abscess. In the other four operative cases, shock and pelvic findings made operation imperative. Four of these women died of infection, six of shock and hemorrhage.

In each instance, because of the delay in seeking medical assistance after pregnancy was suspected, and after symptoms of both hemorrhage and infection were experienced, but also for the misleading history, the responsibility for the death was ascribed to the patient.

Transfusion.—Blood transfusions were given to only thirty-seven women. They may be principally grouped as six, preoperative; twelve during operation and nineteen postoperative.

In the group of six patients who had preoperative transfusions, the procedure repeated in the postoperative period in three, with one also receiving a transfusion during operation. The three patients who had only preoperative transfusion lived long enough for additional support to have been given later.

Transfusions were given during operation to 12 women; of this group one received in addition a pre- and a postoperative transfusion. Two of these were autotransfusions. One of these transfusions was followed by hemolytic reaction proved at autopsy.

Transfusions were given to 19 women 23 times in the postoperative period. Sixteen women were transfused only in this period. Only four patients received more than one transfusion. The time interval in the majority of cases was sufficient to have allowed more transfusions.

It is significant to note that in a group of women sick enough to die in most cases from hemorrhage or infection, that only slightly more than one-third were given transfusions.

Autopsy.—The regulations of the Coroner's office regarding sudden death at home or death within 24 hours after admission to the hospital, helped to produce the high incidence of 69 autopsies in this series of 101 deaths, and served to bring additional light upon many cases.

Causes of Death.—As might be expected, hemorrhage and shock caused the largest number of deaths—68. In three additional cases where hemorrhage was the principal cause peritonitis was also present.

In nineteen cases infection was the cause of death. One patient not operated on because of misleading history of attempted criminal abortion, died of infection.

Complications caused death in ten cases. There were three deaths from pulmonary embolus. Autopsy findings in each, two cerebral vascular accidents, these may have been embolic deaths, one each thyrocardiac, pneumonia, pyelitis and transfusion reaction.

Responsibility and Preventability.—In these as in all other puerperal deaths in Philadelphia since January 1, 1931, an attempt has been made

to determine the responsibility for and the preventability of the death, and the decisions of the Committee on Maternal Welfare of the Philadelphia County Medical Society are given here.

In eighteen deaths, the patients were regarded as responsible. In five additional cases, the responsibility was divided between the patients and a physician.

In thirteen deaths, the responsibility was assigned to one or more referring physicians, in most instances her family doctor, although one woman was misdiagnosed by four separate physicians. In seven additional cases, the responsibility was divided between the referring physician and the chief of the hospital division whose service received the patient.

In forty-five deaths, the responsibility was assigned to the hospital chief alone.

The thirteen deaths regarded as nonpreventable were so assigned where the patient died in spite of prompt recognition of the lesion and adequate surgery with transfusions, or where complications of a medical nature were the cause of death.

The eighteen deaths where the responsibility was assigned to the patients had the following factors: attempts at criminal abortion and misleading history, refusal of hospitalization or delay in seeking medical care.

In the joint responsibility of patient and physician, the factors on the patient's side were delay in medical care and attempt at criminal abortion and misleading history.

Where the referring physician was held responsible, the following factors were found: failure in diagnosis, delay in referring patient to hospital after correct diagnosis was made.

Where the referring physician was joined in responsibility with patient or hospital chief, his fault was entirely in the failure to make a correct diagnosis.

In the 45 deaths where the responsibility was assigned to the hospital chief and in those where he was held jointly responsible, the avoidable factors were error in judgment, with such underlying factors as failure in diagnosis, unexplained delay in operation, multiple surgery, inadequate surgery, no operation, and failure of continued treatment of shock after operation, chiefly lack of transfusion.

Error in technique was regarded as the avoidable factor in 10 cases of infection or secondary hemorrhage. In the whole group where the hospital chief was regarded as responsible for the death, there was a total of 15 deaths from infection.

Summary

This study presents a review of 101 fatalities from ectopic pregnancy occurring among the cases on record in Philadelphia from 1931 to 1943. It represents an attempt to fix responsibility for the death, and to seek out the avoidable factors.

The responsibility has been found to be divided between the patient and her family, the referring physician, and the attending surgeon and his hospital staff. The avoidable factors have been found to include lack of education of laity regarding early and adequate prenatal care; failure of referring physician in recognizing the possibilities of dif-

ferential diagnosis; failure on part of surgeon in diagnosis, delay in operating, lack of transfusion, and poor choice of operative procedure.

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Discussion

DR. JAMES R. MILLER, Hartford, Conn.—To the thorough critical review presented by Dr. Williams, I wish to add a survey of ectopic pregnancy in connection with maternal mortality records in Hartford, Connecticut. The first 20 years of the survey are those which I have previously studied and reported, and it so happens that they represent the period immediately preceding the first use of transfusion in the city (i.e., 1929), in the treatment of ectopic pregnancy.

The figures are as follows:

	1909 TO 1928	1929 TO 1944
1. Live births	62,913	69,704
2. All puerperal deaths	460	192
3. Maternal mortality	0.7%	0.27%
4. Ectopic pregnancies	565	357
5. Ectopic deaths	23	8
6. Fatality percentage	4.8%	2.4%
7. Ratio of ectopic deaths to all maternal deaths	4%	4%

It is further interesting to record that since 1929, St. Francis Hospital reports no deaths in the last 141 cases, and the Hartford Hospital reports only 2 deaths in 184 cases, which gives a combined fatality rate of 0.6 per cent. Neither of the 2 deaths was caused by blood loss, for one succumbed to a typical transfusion (Rh?) reaction after her fourth transfusion, and the other died on the thirty-second postoperative day after repeated pulmonary emboli.

Two sets of factors have brought about this improvement, perhaps the same factors which have operated to reduce maternal mortality in such a spectacular and as yet unexplained fashion. These are: first, earlier diagnosis, earlier hospitalization and earlier consultation with "ectopic minded" specialists, and, second, the rapid replacement of blood loss, appropriate anesthesia, and restriction of operating privileges to those who are qualified. It is evident that a low fatality rate is a measure of the excellence of diagnosis among those practitioners who first see the patients, and to an equal extent, of the excellence of special skill available in the community's hospitals.

It is interesting to speculate on the causes of high or low incidence of ectopic pregnancy. If the important etiological factor is previous salpingitis, we may say that we have been having less salpingitis or have been treating it better than we did two or three decades ago.

DR. FRANK E. WHITACRE, New Orleans, La. (By invitation).—The difficulties in the diagnosis of ectopic pregnancy are well known. It is significant that, in the many reviews in the literature the number of patients operated upon for ectopic pregnancy is carefully analyzed, but rarely is there a mention made of the number of patients operated upon with a mistaken diagnosis of ectopic pregnancy.

Time does not permit a review of the etiology, but in general, any condition which obstructs the passage of the ovum from the ovary to the uterus, whether it be obstruction of the lumen from within or pressure on the tube from without, may produce ectopic pregnancy. In China, where the treatment of pelvic and abdominal tumors is neglected, and where pelvic inflammatory disease is common, it is natural that ectopic pregnancy is prevalent. At the Peiping Union Medical College, 56 ectopic pregnancies were seen between the years 1935 and 1940. An analysis of these accidents is in the process of preparation.

There are three types of cases which present themselves for diagnosis: First, those seen before rupture of the tube or tubal abortion has occurred; second, those

seen during the process of rupture or immediately thereafter; third, those cases seen days or weeks after the accident has occurred. The problems of diagnosis in the first two groups are well established, and it is in regard to the third group of cases that I wish to comment.

In this group, difficulties in diagnosis and treatment arise, for it is well known that pelvic inflammatory disease can produce the same symptoms. We will not review the methods of colpotomy or cul-de-sac puncture, which we still use, but call your attention to a further aid in the diagnosis of obscure cases. We have not been able to find reference in the literature to the use of spectroscopic examination of the blood serum for hematin as an aid in the diagnosis of ectopic pregnancy, although the detection of urobilinogen and the icterus index have been mentioned by Albert Mathieu. We believe that this test is of special value in determining the presence of extravasation of blood and the process of its absorption, as in ruptured ectopic pregnancy, either recent or remote.

Hemoglobin from the blood consists of globin and hematin. Blood coming into the peritoneal cavity decomposes to form hematin, which is absorbed in the blood stream and is detectable within a few hours. Hematin itself gives a weak spectrum. However, with the addition of ammonium sulfide it is reduced to hemochromogen, which possesses a good spectrum, with characteristic and typical bands, a narrow dark band at 5,580, and a faint wide band at 5,270. The test is simple, and a few c.c. of blood drawn from the arm vein can be tested in ten minutes. The technique is described in any standard text dealing with the spectroscope. Even the aspirated blood from cul-de-sac puncture can also be thus examined, and thereby rule out the possibility of confusion caused by the rare entrance of the aspirating needle into an anomalous vein. In the presence of a history and physical findings suggesting ectopic pregnancy, a positive spectroscopic reaction for hematin in the blood serum practically clinches the diagnosis. It is clear that any condition causing extensive hemolysis could give a positive reaction. Therefore, malaria and other hemolytic conditions must be ruled out. It is possible that a hemolytic streptococcus may be the cause of pelvic inflammatory conditions, but even then a positive spectroscopic test is not to be expected unless septicemia is present.

This test is suggested only as an aid in the diagnosis of some obscure cases, and without any thought that it could or should displace the well-known and reliable clinical methods. In our 56 cases, we have used this test only twelve times, and in these instances, it was always reliable. We feel that the test has helped us differentiate between pelvic hematoma and pelvic abscess, and has, therefore, aided us in avoiding doing a laparotomy in the presence of a pelvic abscess, which is usually better drained from below.

DR. LEWIS C. SCHEFFEY, Philadelphia, Pa.—I wish merely to emphasize that there has been a persistent and continuous improvement both in diagnosis and treatment of ectopic pregnancy. At the Jefferson Medical College Hospital, out of 82 patients seen on the ward service from 1921 to 1931, there were 4 deaths, a total mortality of 4.8 per cent. Two of these patients died before being taken to the operating room. The remaining two deaths gave an operative mortality of 2.5 per cent, and one of these patients dying from infection following an autotransfusion, the other as the result of delayed diagnosis. There were 75 admissions from 1931 to 1942, with only one death. This shows a reduction of total and operative mortality to 1.3 per cent, with an operative mortality for the combined series of 1.9 per cent. The combined total mortality was 3.2 per cent. I attribute the improvement in the second decade, as emphasized by both Dr. Williams and Dr. Miller, to the well-known improvement in methods of supportive treatment.

SODIUM PENTOTHAL ANESTHESIA IN OBSTETRICS*

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BETWEEN September 1, 1940, and March 31, 1944, 1,415 deliveries were carried out at the Johns Hopkins Hospital under sodium pentothal anesthesia. Both 2.5 and 5 per cent solutions of the drug were used, but since the latter concentration has proved more satisfactory in our hands, this has been employed in the great majority of the cases. The amount of sodium pentothal necessary for a low forceps delivery together with episiotomy and repair, lies between 0.75 and 1.0 Gm. (from 15 to 20 c.c. of a 5 per cent solution) provided that some form of sedation has been administered in labor such as barbiturates or paraldehyde; in cases in which sedative drugs have not been administered, a somewhat larger dosage of sodium pentothal may be necessary. For cesarean section 1.5 Gm. (30 c.c. of a 5 per cent solution) is the quantity usually required. The amount is never allowed to exceed 2 grams. Except in cases in which scopolamine has been given, atropine (0.5 mg., or $\frac{1}{130}$ gr.) is routine. During the past year, oxygen has been administered prior to the birth of the baby as a prophylaxis, possibly unnecessary, against fetal anoxia. In the majority of the cases reported, either a barbiturate plus scopolamine, or paraldehyde, had been previously administered to amnesic levels and usually such patients were under the full effects of these drugs at the time the sodium pentothal anesthesia was started. Over 90 per cent of the anesthetics were given by members of the house staff, the remainder by professional nurse anesthetists.

Our impression of sodium pentothal anesthesia in general, is in keeping with the many favorable reports which have issued from various surgical clinics. Induction is instantaneous and quiet. The patient is unconscious within twenty or thirty seconds after the first few c.c. of the solution enter the vein, and actual operating can usually be started within a minute or so—this without “pushing” the anesthesia. Postoperative vomiting is rare and there is little “hang-over.” There were but three cases of postoperative pneumonia in the 1,415 cases. In our experience, moreover, patients much prefer sodium pentothal to other types of anesthesia they have had.

As may be seen in Table I, the majority of the cases under consideration represented operative deliveries (68.1 per cent), but a suffi-

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TABLE I. ANALYSIS OF 1,415 DELIVERIES UNDER SODIUM PENTOTHAL ANESTHESIA ACCORDING TO TYPE (SPONTANEOUS OR OPERATIVE), PARITY AND INCIDENCE OF PREMATURITY

Spontaneous		452 (31.9%)	Operative		963 (68.1%)
Primiparas	144		Primiparas	713	
Multiparas	308		Multiparas	250	
Premature		50 (11.1%)	Premature		124 (12.9%)

cient number of spontaneous deliveries (452) were managed under sodium pentothal anesthesia to permit of certain general conclusions. In employing this agent for spontaneous delivery, it was our hope to administer it à la reine toward the end of the second stage, deepening the anesthesia with pains and allowing the patient to regain semiconsciousness between. This proved unsuccessful for two reasons: (1) The procedure entailed dealing for the most part with semi-anesthetized patients and it is well known, of course, that this state of partial anesthesia is associated with particular dangers; (2) since the patient, semiconscious, often moved about under the stimulation of pains, the needle frequently became dislodged from the vein giving rise to serious mechanical difficulties. It is our opinion, accordingly, that sodium pentothal anesthesia is not suitable for spontaneous delivery.

TABLE II. ANALYSIS OF 963 OPERATIVE DELIVERIES UNDER SODIUM PENTOTHAL ANESTHESIA ACCORDING TO TYPE OF OPERATION

Low forceps	777 (80.7%)
Cesarean section	114 (11.8%)
Breech extraction	51 (5.3%)
Version and extraction	15
Craniotomy	3
Midforceps	3

The types of the 963 operative deliveries performed under sodium pentothal anesthesia are shown in Table II. The great majority, of course, were low forceps, and for this procedure this form of anesthesia has rapidly become routine in our clinic. Although the relaxation of the abdominal walls provided by sodium pentothal is not sufficient for many abdominal operations, it is quite adequate for cesarean section. Bleeding is less than with gas-oxygen-ether, as is also, in our opinion, postoperative distention. Of the fifteen versions and extractions reported, six were on second twins, and in the remainder of cases, the babies were small. Except for versions on second twins, sodium pentothal is ordinarily contraindicated for this operation because the uterus does not relax well.

Before considering the fetal and maternal mortality rate in the present series, it is important to note, as shown in Table III, that sodium pentothal passes through the placenta, and within ten or twelve minutes, reaches equal concentrations in fetal and maternal bloods. However, there is a period of five minutes after starting the anesthesia during which the amount of drug reaching the fetus is very small and

TABLE III. MG./100 BLOOD ACID PENTOTHAL IN MOTHER AND CHILD AT DELIVERY

GM. OF SODIUM PENTOTHAL GIVEN	DURATION OF ANESTHESIA	MOTHER MG./100	INFANT MG./100
0.7 Gm.	5 minutes	3.9	0.8
0.45 Gm.	6 minutes	2.5	1.4
0.35 Gm.	7 minutes	2.4	1.25
0.55 Gm.	9 minutes	3.0	1.75
0.40 Gm.	12 minutes	2.25	2.50
1.00 Gm.	12 minutes	6.2	5.0
0.55 Gm.	15 minutes	0.75	0.5

throughout the first ten minutes is decidedly less, as a rule, than after fifteen or twenty minutes of anesthesia. This fact should not be taken as an indication to hurry the delivery; however, it does afford an opportunity to spare the fetus an unnecessary quantity of the drug, that is, the start of the anesthesia should be postponed until everything is in immediate readiness for the operation. The method employed for the determination of sodium pentothal in the blood was developed by Hellman and Shettles and has been published elsewhere.

TABLE IV. STILLBIRTH AND NEONATAL MORTALITY (COMBINED) IN 1,421 INFANTS DELIVERED UNDER SODIUM PENTOTHAL ANESTHESIA

	INFANTS	DEATHS	PER CENT
Total infants	1,421	70	4.9
Fetal heart heard prior to anesthesia	1,386	33	2.4

The stillbirth and neonatal mortality rates (combined) for the 1,421 infants born in this series are shown in Table IV. For the purposes of this study, the neonatal period includes the period of stay in the hospital up to and including the thirtieth day; the usual duration of stay was ten days. There were seventy cases in which the baby was lost, giving a total stillbirth and neonatal mortality rate, uncorrected, of 4.9 per cent. Among these seventy cases associated with fetal exitus, there were fifteen cases of premature separation of the placenta in which the fetal heart was not heard on admission to the hospital; there were three cases of prolapse of the umbilical cord, pulsations having stopped on admission; there were three cases of hydrocephalus necessitating craniotomy; four cases of fetal death in utero long before the onset of labor, and a number of other cases in which the fetal heart ceased for various reasons prior to the onset of the anesthesia. If we are to make an intelligent attempt to evaluate the possible effect of sodium pentothal on fetal prognosis, it would seem obligatory to eliminate from consideration these cases (thirty-seven in all), in which the fetus had clearly died before the anesthetic was started, or suffered craniotomy. If this subtraction be made, the resultant stillbirth and neonatal mortality rate becomes 2.4 per cent, that is, thirty-three infants lost among 1,384 infants, in all of which cases the fetal heart was audible when the anesthesia was started.

The causes of death in these thirty-three infants are listed in Table V. The ten premature infants all weighed less than 2,000 grams and showed at autopsy extensive atelectasis. The question may be raised,

TABLE V. CAUSES OF THIRTY-THREE INFANT DEATHS—IN ALL OF WHICH CASES THE FETAL HEART WAS AUDIBLE BEFORE ANESTHESIA WAS BEGUN

DIAGNOSIS	INFANTS
Prematurity	12
Intracranial hemorrhage	8
Congenital abnormality	5
Excessive size baby (5,320 Gm.); traumatic delivery	1
Meningitis—21 days post partum	1
Unknown	4
(Maternal diabetes 1; Face presentation 1; Breech presentation 1; Intrapartum infection 1)	
Asphyxia following placenta previa	2
	33

of course, as to whether the anesthesia may not have contributed to the pulmonary inadequacy. This possibility cannot be denied, but on the other hand, it may be stated that our prematurity mortality with sodium pentothal has been slightly less than with other forms of anesthesia. There were four cases, listed as "Unknown," in which the cause of death was not altogether clear, but in each of these cases, a pathological condition was present which could well have accounted for the infant's death. In order to inquire further into the effect of sodium pentothal anesthesia on stillbirth and neonatal mortality, we have compared the total infant loss in our series of operative deliveries done under sodium pentothal with a comparable number of operative deliveries performed under gas-oxygen-ether anesthesia. As may be seen in Table VI, the rates both in the two total series and in the two groups of full-term cases are practically identical. As far as we have been able to determine, there was no instance in the entire series of 1,415 cases delivered under sodium pentothal anesthesia in which this anesthetic agent was directly responsible for an infant's death, or in which it played any demonstrable role.

TABLE VI. STILLBIRTH AND NEONATAL MORTALITY RATES (COMBINED) IN 1,467 OPERATIVE CASES DELIVERED UNDER GAS-OXYGEN-ETHER ANESTHESIA (1937 TO 1939) AND IN 963 OPERATIVE CASES DELIVERED UNDER SODIUM PENTOTHAL (1940 TO 1944)

	GAS-OXYGEN-ETHER			SODIUM PENTOTHAL		
	CASES	DEATHS	PER CENT	CASES	DEATHS	PER CENT
Total	1,467	88	6.0	963	55	5.8
Full term only	1,400	50	3.6	839	30	3.6

It is our impression that blood loss is less with sodium pentothal than with gas-oxygen-ether. The incidence of postpartum hemorrhage in the present series (600 c.c. or more) was 2.8 per cent.

There were two maternal deaths in the series as follows:

U. 251,366.—Registered, colored 19-year-old primigravida, E. D. C., 6/12/42; twin pregnancy. Eight visits to prenatal clinic. No deviations from normal until eighth visit, 5/28/42, when blood pressure was 150/100, albumin trace, weight gain 4 pounds in last week; slight edema, no symptoms. Admission to hospital, 11:00 A.M., 5/28/42.

During first eight hours in hospital blood pressure rose to 190/110; albumin 2+; headache, vomiting, epigastric pain. Paraldehyde 20 c.c. every 4 hours, per rectum.

Twenty-five hours after admission (12 noon, 5/29/42), blood pressure 170/110. Cervix 1 cm. dilated; half effaced; head at spines. Membranes stripped back and *ruptured artificially* (12:30 P.M., 5/29/42).

Latent period, 3 hours. Marked uterine inertia with 29-hour first stage, blood pressure remaining 170/110, albumin 4+. Restlessness changed to apathy, then to semicoma; anuria developed; then generalized convulsion at 6:00 P.M., 5/30/42 (30 hours after induction).

Following convulsion, blood pressure fell to 110/70; pulse 160 to 170 with picture of collapse; semicoma. After 2½-hour second stage, delivery under sodium pentothal anesthesia of stillborn, macerated twins at 10:50 P.M., 5/30/42. Only 0.5 Gm. of sodium pentothal was used. Despite transfusion with whole blood and plasma, blood pressure fell. Marked edema of lungs; temperature 104.3° F.; pulse 170.

Death occurred 6:48 A.M., 5/31/42, eight hours post partum; no autopsy.

U. 287,822.—Colored 16-year-old primigravida at term, referred from Calvert County, Maryland. Blood pressure 190/130; albumin 10 grams per liter; history of 74 pounds weight gain in pregnancy; massive edema, eyes nearly swollen shut and edema of thighs so marked as to interfere with rectal examination; nearly blind; headache, epigastric pain and vomiting for 3 days.

After 4 hours of observation and sedation, cesarean section done at 11:30 P.M., 3/29/43. While anesthesia was being induced with sodium pentothal, and after 0.75 Gm. had been given, the patient suffered either an atypical convulsion or laryngospasm. The sodium pentothal was stopped, and drop ether given for the entire duration of the operation.

After operation, persisting coma and edema of lungs. Blood pressure 175/95 but fell progressively.

Death at 11:35 A.M., 3/30/43 with picture of overwhelming edema of lungs.

Autopsy showed extreme edema of lungs; eclamptic liver.

In regard to the first of these deaths, the condition of the patient was becoming progressively worse for several hours prior to delivery and continued downhill at about the same rate post partum. There was no evidence that the anesthetic aggravated the patient's condition. Although the second case must be classified as an anesthetic death, it can be charged against ether with as much justification as against sodium pentothal, and can be charged with even greater validity to poor clinical judgment on our part. On retrospect the extraordinary fulminance of the toxemia process, long neglected, made cesarean section under any form of anesthesia hazardous and, in our opinion, it was probably this step rather than the sodium pentothal used for induction which was the deciding factor in the fatal outcome.

In addition to the 1,415 cases herewith reported in which sodium pentothal anesthesia was used for delivery, we have employed this anesthetic agent successfully in approximately 500 additional obstetric operations not intended for immediate delivery of an infant—notably in puerperal tubal ligation, completion of incomplete abortion, artificial rupture of the membranes for the induction of labor, and manual removal of the placenta.

In conclusion, it is not the purpose of this paper to claim that sodium pentothal is an ideal anesthetic for operative obstetrics nor even that it is the best—certainly not for all cases. As our figures indicate, however, we have found it satisfactory in a substantial series of cases, are using it almost routinely for low forceps and cesarean sections, and believe that it constitutes an important addition to obstetric anesthesia.

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Discussion

DR. THADDEUS L. MONTGOMERY, PHILADELPHIA, PA.—Reports upon the use of intravenous anesthesia in obstetric practice have appeared from time to time in the medical literature of recent years (Rucker,¹ Kassebohm and Schreiber,² Solomons,³ La Brecque,⁴ Hunt and Lundy⁵). None of them compares in size or scope with the series which Dr. Eastman has presented this morning, and none comes so close to telling what is the place of this newer anesthetic agent in obstetric practice.

The author's statement that "it is not the purpose of this paper to claim that sodium pentothal is an ideal anesthetic for operative obstetrics, nor even the best," but that "we have found it satisfactory in a substantial series of cases" is a measured expression of opinion in a field where overstatement is so often the rule.

If I had any criticism to offer, it would be with his failure to point out some of the dangers and the contraindications of the method. Some of these situations may be surmised from the content of the paper, others are so well recognized in surgical practice that they certainly must apply to obstetric procedure as well.

In view of the fact that pentothal is eliminated through the liver and may add to degenerative changes in that organ, one should be cautious in employing this drug in pre-eclampsia, just as he would in administering chloroform. Wherever there is already respiratory depression, a tendency to pulmonary edema, and faulty exchange of oxygen and carbon dioxide—as exists in advanced pre-eclampsia—one would be additionally hesitant to employ an agent that has known respiratory depressant effects. Its use therefore, in the two toxemic patients who died seemed to me unwise, although it may not have precipitated the fatal issue.

Since it is known that pentothal is rapidly conveyed across the placental barrier to the fetal blood stream, and since it has been demonstrated by Dreisback and Snyder⁶ that intravenous pentothal reduces the respiratory activity of the intra-uterine animal to a level below one-third, it seems unwise to employ this agent in cases of prematurity, for fear of inhibiting the initial respiratory effort in the newborn infant.

In the presence of active or of potential hemorrhage, most of us are loath to employ intravenous anesthesia. Personally, I have seen one or two disturbing reactions when it was given for the evacuation of freely bleeding incomplete abortions. We have abandoned its usage in such cases, preferring cyclopropane. Wood and

Jaco⁷ find a 24 per cent reduction in the lethal dose of pentobarbitone after hemorrhage of 20 c.c./kg. in rabbits, and Bernstein and Hershey⁸ point out on the basis of their clinical and experimental observations the unpredictable effect of pentothal sodium on the circulatory system in the face of hemorrhage. For these reasons, one should be hesitant in employing pentothal in the presence of actual or potential obstetric hemorrhage.

Finally, Dr. Eastman states that these anesthetics were all administered by members of his resident staff or by nurse anesthetists. No doubt with the frequent experience acquired from such a large series of cases, his departmental personnel soon became competent to administer and supervise intravenous pentothal anesthesia. A word of caution is in order, however, for the obstetrician who conceives of employing this agent in the *occasional case*. This method is not without its intrinsic dangers, technical difficulties, and its own complications, as listed by Hunter,⁹ independent of the obstetric problems involved. The anesthesia cannot be supervised satisfactorily from the far end of an obstetric delivery table. It is better to call in a skilled anesthetist to handle the anesthesia while you tussle with the obstetric delivery.

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DR. M. PIERCE RUCKER, RICHMOND, VA.—Before the advent of pentothal sodium anesthesia, I had had considerable experience with evipal anesthesia in obstetrics at Brookfield. This is a home for unmarried girls and there is no anesthetist regularly in attendance. Under the circumstances, intravenous anesthesia with evipal soluble answered very well in most instances. A single measured dose according to the weight of the patient was given, gloves were changed, forceps applied, an episiotomy done, the baby delivered, and the perineum was repaired. If there was no hitch, the patient awakened just as the repair was finished. However, if the baby needed resuscitation some other anesthetic, such as local, was needed for the repair, but this was rarely necessary.

With this background, when sodium pentothal was shown to be a safe anesthetic in selected surgical cases, I had fewer misgivings about using it in obstetrics than I otherwise would have had. On the obstetrical service of the Johnston-Willis Hospital we have used pentothal sodium for 758 anesthetics. Ninety-eight of the cases on the obstetrical service did not involve a viable baby, the cases in which this type of anesthesia was used are tabulated on page 858.

There was no conscious selection of cases. In most instances, the patient was given some form of first stage sedation, usually sodium amytal and hyoscine with rectal ether or paraldehyde as indicated. In some of the more recent cases, demerol was used. In a few patients who went into labor prematurely, an effort was made

Dilatation and curettage	83
Delivery of the placenta	3
Vaginal packing	1
Abdominal abortion	1
Vaginal salpingectomy	1
Incision of breast abscess	1
Abdominal hysterectomy	3
Cautery and minor surgery	3
Chorionepithelioma	1

In 660 cases, a viable infant was involved. The types of delivery being as follows:

Spontaneous delivery	55
Low forceps	435
Midforceps (including 3 Scanzoni applications)	94
Breech extractions	26
Version and extraction	48
Craniotomy	1
Low flap cesarean section	1
	<hr/> 660

to stop labor with morphine, and if this were unsuccessful, they were given hyoscine, paraldehyde, etc. When the presenting part is out of the cervix, it is our custom to give the patient an anesthetic and deliver her by whatever means seem to be the easiest in the particular case. Except where inhalation anesthesia is contra-indicated, or where the patient has expressed a desire for a particular kind of anesthesia, the choice of the anesthetic is left to the intern. The interns change so rapidly now that I am unable to say what were their guiding principles, if any. Some interns like to give intravenous anesthesia and give it well. Others are somewhat indifferent and prefer to pour a little ether.

The first 100 cases of this series were reported by Dr. Edwin Rucker in 1942. He started using a 2.5 per cent solution, and I have seen no reason for changing. The maximum dose used was 1,500 mg., the minimum 175 mg., and the average was 625 milligrams. I have not exceeded the extremes mentioned above, but the average dose has been somewhat reduced. I rarely use now as much as a half gram. There have been no complications on the delivery table. Sometimes when the respirations become very shallow, we give the mother oxygen in order to prevent anoxia of the baby.

Of the 660 babies, eight died within two weeks. Five died intrapartum, and three were classed as antepartum deaths, two of the latter being macerated. This makes a gross fetal mortality of 2.42 per cent.

There were the following maternal complications:

Eclampsia	1
Pre-eclampsia	6
Ablatio placentae	1
Detachment of the retina	1
Placenta previa	3
Inertia	6
Constriction ring	13
Incarcerated placenta	1
Prolapsed arm	2
Prolapsed cord	1
Postpartum hemorrhage	7
Febrile puerperium	38
Phlebitis	2
Mastitis	12
Pyelitis	14
Cystitis	4
Urinary retention	22
Cholecystitis	1
Acute dilatation of the stomach	1
Hydramnion	1
Psychic disturbances	5

There was one maternal death. No autopsy could be obtained in this case, but the symptoms were similar to those described by Steiner and Lushbaugh as being due to multiple emboli of the lungs. The patient was an 18-year-old primipara. Labor was induced at term by rupturing the membranes. After a latent period of five hours and twelve minutes and a labor of seventeen hours and thirty-nine minutes, the cervix was fully dilated. The head was in R.O.P. position. An easy version and extraction were done. The anesthetic consisted of sodium amytal, gr. vi, hyoscine gr. $\frac{5}{200}$, paraldehyde 3ii, rectal ether 3iiss, sodium pentothal 625 mg., and pudendal block with novocain. The baby, a girl, cried promptly and did well. One cubic centimeter of ergotrate was given the mother as soon as the aftercoming head was out of the cervix, and the intact placenta was delivered two minutes later. It was followed by a little trickle of blood such as we do not often see with the use of ergotrate intravenously. The cervix was inspected and was found unlacerated, and bleeding was easily controlled by elevation of the fundus with the hand on the abdomen. The patient regained consciousness before the episiotomy repair was completed. She was put to bed in apparently good condition with a blood pressure of 90/60. However, her respirations were 60, and her pulse was 200. This was attributed to the hyoscine that had been given her and the restlessness that it had induced. About one and three-quarter hours after delivery, her condition suddenly changed and she died two hours after delivery. A few minutes before she died, there was a moderate vaginal hemorrhage. As an indication that there was no selection of cases, I append the following list of accompanying diseases in these 758 patients.

Upper respiratory infection	24
Severe asthma	1
Typhoid vaccination (antepartum)	2
Enteritis	11
Mucous colitis	1
Intestinal obstruction	1
Appendicitis	2
Exploratory operation	1
Mumps	2
Measles	1
Abscess of tooth	4
Corneal ulcer	1
Iritis	1
Food poisoning	1
Hernia	2
Peptic ulcer	1
Diabetes	2
Infectious arthritis	2
Acute nephritis	1
Chronic nephritis	2
Obesity	24
Chorionepithelioma	1
Hepatitis (after yellow fever vaccine)	1
Otosclerosis	1
Migraine	3
Epilepsy	3
Hay fever	1
Urticaria	5
Furunculosis	1
Scabies	2

It is my considered opinion that sodium pentothal has a place among the obstetric anesthetics.

DR. RICHARD W. TE LINDE, BALTIMORE, MD.—As a supplement to Dr. Eastman's report on pentothal sodium in obstetrics, I would like to give you our experience with this anesthetic agent in the gynecological service at Johns Hopkins. From October, 1939, until March, 1944, we have used pentothal sodium as an an-

esthetic 4,643 times without a single death that could be attributed to the anesthetic. At first we used it only for minor procedures, and such are still our commonest indications, as a total of 3,920 of our 4,643 cases were minor ones. Pentothal sodium has greatly facilitated the work of a busy operating room because the induction period is so brief and the period of recovery short and pleasant.

Pentothal has helped us in the present hospital bed shortage, for we now rarely hospitalize a patient for a diagnostic curettage. She is instructed to come to the operating room at an appointed hour without breakfast. The heart and lungs are checked before the anesthesia is administered. Following the minor operative procedure, the patient is permitted to rest for several hours on a bed in a room on the operating room floor. Late in the afternoon she goes home in company with a friend. She is never permitted to drive her own car home. In carrying out this routine, we have had no complications after the patients have left the hospital.

We have gradually extended the use of pentothal sodium and have found it of great value in relatively short vaginal plastic operations, such as those which can be done in an hour. Often this hour of anesthesia can be obtained with 1.0 Gm. of pentothal sodium in combination with a 50/50 nitrous oxide-oxygen mixture. We have found it of special value in plastic operations on elderly people with pro-lapse and allied conditions when it is desirable to avoid ether anesthesia. Occasionally, we have used it with nitrous oxide and oxygen for longer major operations when other anesthetic agents were contraindicated, but we have made it a rule never to exceed a total dosage of 2.0 grams.

Finally, we are using pentothal sodium with increasing frequency for induction before ether anesthesia. By using 0.1 Gm. of nembutal or seconal for premedication and pentothal for induction, we have been able to obtain all the advantages of avertin basal anesthesia, without the disadvantages.

The only complication of any consequence which we have encountered is an occasional laryngospasm. Forced oxygen and artificial respirations have in each instance overcome this. It is important to insist upon an empty stomach, for vomiting may throw the larynx into spasm.

We use the drug only in 2.5 per cent solution. Since doing this, we have had no venous thromboses and the increased volume over the 5 per cent solution of itself insures a slower induction which is less apt to result in laryngospasm.

DR. EASTMAN (closing).—We began the use of pentothal sodium anesthesia with some trepidation but as we gained more confidence in it, we found that we were employing it in our most desperate cases. Our series contains a large number of cases of placenta previa and premature separation of the placenta. Although there may be theoretical objections to the drug in the cases associated with hemorrhage, we seem to have had very satisfactory results in this type of complication and are continuing to use it.

Dr. Montgomery's criticism of sodium pentothal anesthesia in severe toxemias of pregnancy is more valid, in my opinion, and in the light of our experience, we are inclined to question the wisdom of its use in severe pre-eclampsia. Of course, that would apply to any form of general anesthesia.

Special Article

REPORT OF FIRST 50 CASES OF THE OVARIAN TUMOR REGISTRY CONDUCTED BY THE AMERICAN GYNECOLOGICAL SOCIETY*

EMIL NOVAK, M.D., BALTIMORE, Md.

THE American Gynecological Society appointed, in 1942, from its Fellows a "Committee on Ovarian Tumors," whose function was to be the inauguration and conduct of an **American Registry of Ovarian Tumors**. The committee consists of Drs. Robert Meyer, George H. Gardner, Karl H. Martzloff, Herbert F. Traut, and the writer as chairman. The need for such a project seemed obvious. The great frequency and the clinical importance of ovarian neoplasms, the lack of knowledge concerning the histogenesis of most of these, the confusion and unsatisfactoriness of systems of classification and nomenclature, the uncertainties as to the prognosis in many tumor types, the increasing interest in certain rather newly recognized types and the inadequacy of our knowledge as to their pathological and clinical characteristics—all these considerations pointed to the need of some cooperative attempt to advance our knowledge in this important field.

It seemed clear that the keystone of such an undertaking, aside from the primary one of collecting suitable material in sufficiently large amount, must be to correlate authoritative pathological study with observations as to the clinical course of the tumors under study. As by-products of such an investigation one might hope that something could be learned as to the histogenesis of ovarian neoplasms, as well as to certain group characteristics, so that a more generally satisfactory system of nomenclature might ultimately be worked out for the guidance of both clinicians and pathologists. While it might be a good many years before a sufficiently large number of some of the relatively rare ovarian tumors could thus be accumulated, the Registry should sooner or later develop into a valuable storehouse of material which had been evaluated with reasonable authoritativeness, and this material could be made available for future investigators in this field.

The general plan of work of the committee need not be here reviewed, having been outlined in two announcements made in the *JOURNAL OF OBSTETRICS AND GYNECOLOGY* (September, 1943, and January, 1944), and one in the *Journal of the American Medical Association*. It is still far from perfect in its working, and improvements will undoubtedly have to be made. Some of these have been discussed in the formal report to be made at the business meeting of the Society. The collection of material for study has been in operation only since the first announcements were published, scarcely more than one and a half years ago, and during this time the committee has just about gotten the "feel" of its job. The number of cases thus far submitted to the committee is still relatively small, and one of the purposes of this preliminary paper is to imbue clinicians and pathologists with the importance of such a cooperative project.

*Presented at the Sixty-Eighth Annual Meeting of the American Gynecological Society, Hershey, Pa., June 19 to 21, 1944.

Another reason was the feeling that the Fellows of the sponsoring organization would be interested in hearing something as to the kind of material which has thus far been gathered, since it can be taken as an index of what might be expected in the future. This report is limited to the first 50 cases referred to the Registry, simply because that relatively small group permits of at least a very brief recording of each. In addition, a few of the more interesting cases, especially those in which the diagnosis has been doubtful, are described somewhat more fully, with photomicrographic illustration, and these may even possess some educational value.

As might be expected, and as is inevitable with any large amount of pathological material, a small proportion of cases was encountered in which the pathological diagnoses made by different members of the committee differed rather sharply and sometimes irreconcilably. Most of these are included in the illustrations accompanying this paper. On the other hand, in the overwhelming majority of the cases, there has been essential unanimity in the diagnoses submitted by the members of the committee. The occasional discordancy of a single member's diagnosis has been disregarded in the final classification.

As will be noted in reviewing the short case synopses of the fifty cases herein submitted, there have been not a few in which the clinical history has been very incomplete, sometimes through no fault of the contributor, and others in which the slides submitted were likewise far from satisfactory. For the present it has seemed best not to reject these cases from study, although it is possible that they may have to be winnowed out of the Registry later.

One of the most important parts of the committee's work will be the follow-up study of all Registry cases, and such data have been secured on most of the cases included in this report. Since many of these cases are very recent, and since the number of cases of any one tumor group is still very small, there would be no point in tabulating these follow-up studies in this early phase of the work. A brief note as to the present condition of the patients is, however, appended to each of the short case synopses, where such information has already been obtained.

Table I is a tabulation of this first group of 50 cases, and it shows the wide variety and the interesting character of the material which is being

TABLE I

Primary adenocarcinoma	1
Secondary adenocarcinoma	4
Serous papillary cystadenocarcinoma	4
Granulosa cell carcinoma	9
Thecoma	4
Arrhenoblastoma	1
Dysgerminoma	3
Brenner tumor	4
Mesonephroma	1
Krukenberg tumor	3
Lymphosarcoma	1
Adrenal tumor	2
Fibroma	2
Pseudomucinous cystadenoma (with fibroma)	1
Serous cystadenoma	1
Endometrial cyst	1
Corpus luteum cyst	1
Doubtful	7
Total	50

received. The committee is most grateful to the many physicians who have helped in this cooperative study by sending in material and supplying clinical and follow-up information. Below is given a very brief synopsis of each of the 50 cases on which this first report is based.

Case Reports

CASE 1.—(Dr. W. P. L. McBride, Rutland, Vt.) Tumor of right ovary in child 5 years of age. Preoperative diagnosis—acute appendicitis, but operation (July, 1942) disclosed friable infiltrated mass in region of right ovary, with numerous implants on peritoneum and adjacent bowel. Death soon after operation. Previous health good, with no abnormal sex characteristics.

Classification. Secondary adenocarcinoma of ovary (primary seat unknown). (Fig. 1.)

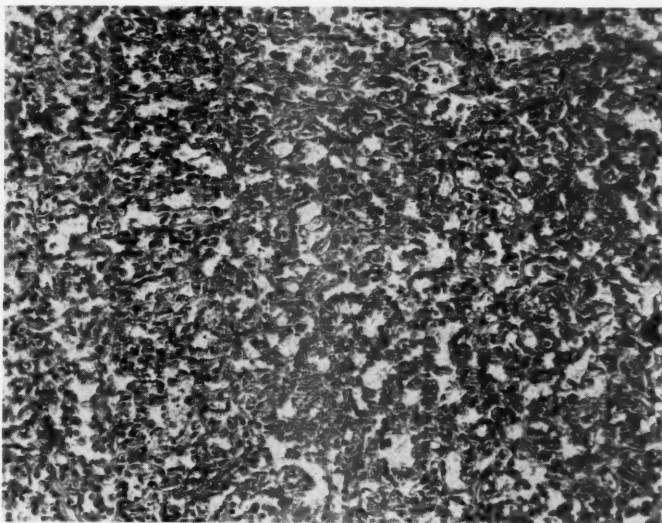


Fig. 1.—(Case 1.)

CASE 2.—(Dr. A. F. Liber, Amsterdam, N. Y.) A typical Brenner tumor (received Dec. 6, 1942) from a patient of 42.

Classification. Brenner tumor of ovary. (Fig. 2.)

Follow-up. Patient living and well May 1, 1944.

CASE 3.—(Dr. Arthur Stein, New York, N. Y.) Bilateral papillary cystic tumor of ovaries in patient of 42. No evidence of peritoneal metastasis at operation (Feb. 15, 1939).

Classification. Serous papillary cystadenocarcinoma with areas of benign fibroadenoma.

Follow-up. Patient perfectly well November 30, 1942, nearly 4 years after operation. She had received postoperative x-ray treatment.

CASE 4.—(Dr. Arthur Stein, New York, N. Y.) The patient, aged 51, had been operated on in France 2 years previously with removal of both ovaries, this being preceded by two abdominal paracenteses for ascites. At second operation, January 30, 1942 (Dr. Stein), large amount of fluid evacuated, and large mass found filling pelvis, with numerous metastatic nodules of peritoneum. A piece of omentum was excised for microscopic study.

Classification. Metastatic adenocarcinoma of omentum (primary seat ovary).

Follow-up. The patient died on October 24, 1942.

CASE 5.—(Dr. John C. Henthorne, Jackson, Miss.) This patient, a colored woman, was operated upon by Dr. J. K. Avent, of Grenada, Miss., who was able to furnish only scant information. Her age was not obtainable. A vaginal hysterectomy was done (December, 1942), and the surgeon found "colloidal degeneration of the left ovary, spreading into the left broad ligament and bladder." The uterus showed multiple myomas. A second operation was contemplated later.

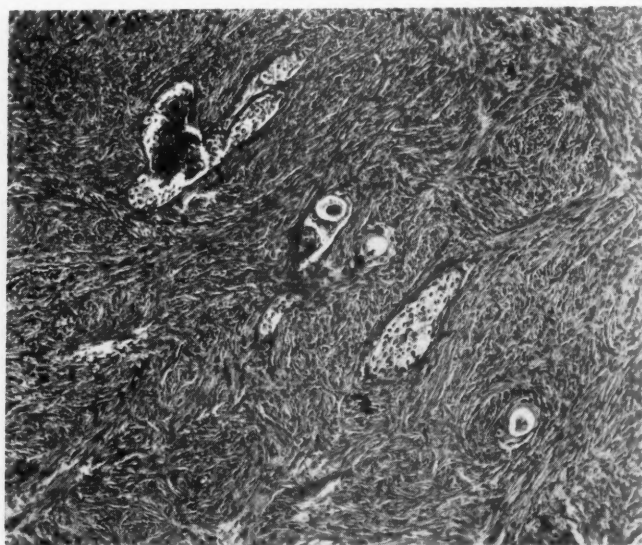


Fig. 2.—(Case 2.)

Classification. On this point, there were sharp differences of opinion among the Committee, all agreeing that the tumor was a most unusual one. Two were inclined to believe that it might be considered a mesonephroma, while one stated that "it is certainly not a mesonephroma," but that it might be a serous cystadenocarcinoma of very unusual type. The remaining two members considered it to be a tumor of mesotheliomatous type, one of these suggesting that it might be called an "endothelioma malignum."

Follow-up. Patient died 14 days after operation.

CASE 6.—(Dr. Eugene H. Countiss, New Orleans, La.) The patient, aged 11, had noticed a lower abdominal mass about December 1, 1942. No abnormal sex changes were noted. Operation disclosed a well-encapsulated, solid tumor of the left ovary, measuring 12 by 8 by 8 cm. in size. The uterus and right adnexa were normal.

Classification. Typical dysgerminoma.

Follow-up. Living and well (May 15, 1944). Now aged 13. Menstruation has not yet begun.

CASE 7.—(Dr. C. Gordon Johnson, New Orleans, La.) A tumor of ovary (received December, 1942) measuring 2.5 by 2 by 0.8 cm. associated with multiple myomas of uterus, in a patient of 43 years of age.

Classification. Typical Brenner tumor of ovary.

Follow-up. Patient living and well May 1, 1944.

CASE 8.—(Dr. Arnold Branch, St. Johns, New Brunswick.) Patient, aged 33, was operated upon December 2, 1942, on the diagnosis of pelvic inflammatory disease, retroflexion and right ovarian tumor. Right salpingo-oophorectomy and left salpingectomy were done. The right ovary was described as "like a fibroid, only slightly enlarged, retaining original shape, with no gross cysts but with some degeneration of central part."

Classification. Three of the Committee considered this a Brenner type of tumor, though all qualified this by commenting on certain unusual features, such as the adenomatous or metaplastic changes, one suggesting secondary serous cystadenomatous change. The other two members looked upon the tumor as a fibro-adenoma with metaplastic changes, one of these two considering these of rather grave import. (Fig. 3.)

Follow-up. Patient living and well as of May 15, 1944.

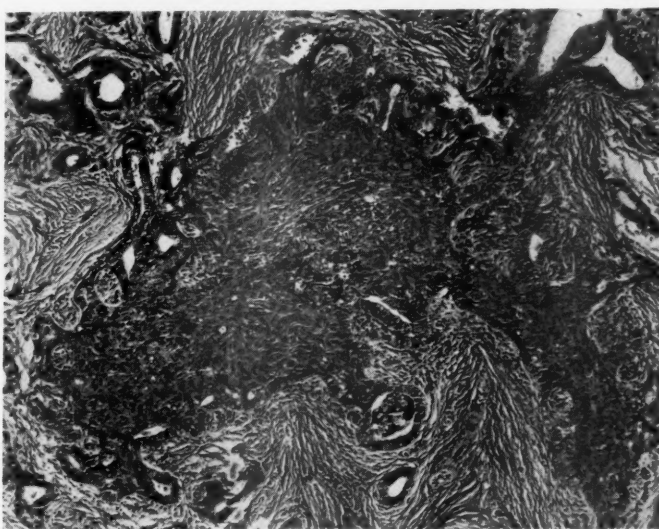


Fig. 3.—(Case 8.)

CASE 9.—(Dr. John C. Henthorne, Jackson, Miss.) Bilateral papillary tumors (operation January 18, 1943) from patient of 43, with no symptoms except some vaginal discharge for 3 months.

Classification. Histologically benign serous cystadenoma.

Follow-up. Patient living and well May 1, 1944.

CASE 10.—(Dr. Wilson Footer, San Francisco, Calif.) The material included sections from bilateral tumors of the ovaries, as well as from many other organs, obtained by autopsy from a patient of 40, the primary lesion being a gelatinous carcinoma of the sigmoid.

Classification. Krukenberg tumor of ovaries (adenocarcinoma mucocellulare).

Follow-up. This was an autopsy specimen.

CASE 11.—(Dr. John E. Hobbs, St. Louis, Mo.) Sections from a tumor of the right ovary removed by radical operation by Dr. Otto Schwarz (January, 1943) from a patient of 44, who had had irregular bleeding for 10 months, with a history of two diagnostic curettings, the first (followed by radiation) showing typical Swiss-cheese hyperplasia and the second, shortly before the laparotomy, a picture interpreted as adenocarcinoma of low grade, which opinion was shared by the majority of our Committee.

Classification. Luteinizing thecoma (Loeffler-Priesel tumor) with grade I adenocarcinoma of the endometrium.

CASE 12.—(Dr. Roy W. Hammack, Los Angeles, Calif.) A large solid tumor of right ovary weighing 920 grams from a woman of 56, in whom free bleeding had developed 3 years after the menopause. Hysterectomy with bilateral removal of adnexa on December 27, 1939. The cut surface of the tumor was described as "fasciculated, partly gray but much of it yellow."

Classification. Thecoma of right ovary.

Follow-up. Living and well December, 1940, but no later information obtainable.

CASE 13.—(Dr. Roy W. Hammack, Los Angeles, Calif.) Sections of tumor of left ovary, with diameter of about 10 cm. removed December 11, 1942, from a patient of 53, who had had hysterectomy, right salpingo-oophorectomy and left salpingectomy 14 years previously, with no bleeding since then. Section from previous operation not available.

Classification. Luteinizing granulosa cell carcinoma.

Follow-up. Developed right inguinal mass October 19, 1943, and this diagnosed as lymphoblastoma. Recession following radiation and patient fairly well in March, 1944.

CASE 14.—(Dr. Roy W. Hammack, Los Angeles, Calif.) A large partly cystic left ovarian tumor measuring 18 by 13 by 10 cm. and showing extensive necrosis, from a woman of 37. Uterus and right adnexa normal, and no peritoneal metastases at operation August 20, 1942 (left salpingo-oophorectomy).

Classification. Serous cystadenocarcinoma.

Follow-up. No definite evidence of recurrence, but much general weakness (May 15, 1944).

CASE 15.—(Dr. Karl John Karnaky, Houston, Tex.) Sections of ovary and uterus from a woman of 50. Aside from the history of bleeding, Dr. Karnaky reported as of special interest that this patient had been given 5 mg. of stilbestrol daily for 52 days. At operation February, 1942, there was a large tumor of the right ovary, the uterus was somewhat enlarged, and the left adnexa were normal.

Classification. Secondary adenocarcinoma of ovary, primary seat adenocarcinoma of uterus.

CASE 16.—(Dr. Karl John Karnaky, Houston, Tex.) A solid nodular tumor of ovary measuring 6 by 6 by 3 cm. in a woman of 40, with no menstrual or sex abnormalities—operation January 11, 1943.

Classification. Brenner tumor.

CASE 17.—(Dr. John A. Watkins, Asheville, N. C.) Bilateral "chocolate" cysts of ovaries, one said to be size of orange, the other as large as grapefruit. No clinical data. Operation January, 1943.

Classification. Endometrial cyst of ovaries (bilateral).

Follow-up. Patient living and well except for menopausal symptoms (May 15, 1944).

CASE 18.—(Dr. Robert P. Morehead, Winston-Salem, N. C.) Sections of tumor of ovary from a patient of 58, whose only symptoms were backache and vaginal discharge for 4 months, with no mention of any sex changes, though clinical data incomplete. The small ovarian tumor (received February 27, 1943) makes up three-quarters of an ovary measuring 4 by 3 by 2 cm. It is well encapsulated and of yellowish-gray color.

Classification. Luteinized granulosa cell tumor. (Two members thought the tumor to be of adrenal type.)

CASE 19.—(Dr. J. L. Goforth, Dallas, Tex.) Sections of right ovarian tumor (received March 30, 1943) from a woman of 53, who had had irregular bleeding for 6 months, the menopause having occurred some years previously. The tumor was small and spherical, yellowish, occupying the central part of the ovary which measured 4 cm. in diameter. The uterus and left adnexa were normal.

Classification. Thecoma of ovary.

CASE 20.—(Dr. C. Gordon Johnson, New Orleans, La.) The patient was a colored girl of 24, who had ceased to menstruate 8 years previously, and who developed flattening of the breasts, deepening of the voice, hirsutism, and enlargement of the clitoris. There was a tumor of the right ovary which at operation (April, 1943) measured 13 cm. in diameter. It was well encapsulated, and on section showed soft nodular areas of yellow hue, with also areas of hemorrhage. The left ovary showed a small dermoid cyst, and the uterus was normal. Supravaginal hysterectomy with bilateral salpingo-oophorectomy was done.

Classification. Arrhenoblastoma of ovary. (Fig. 4.)

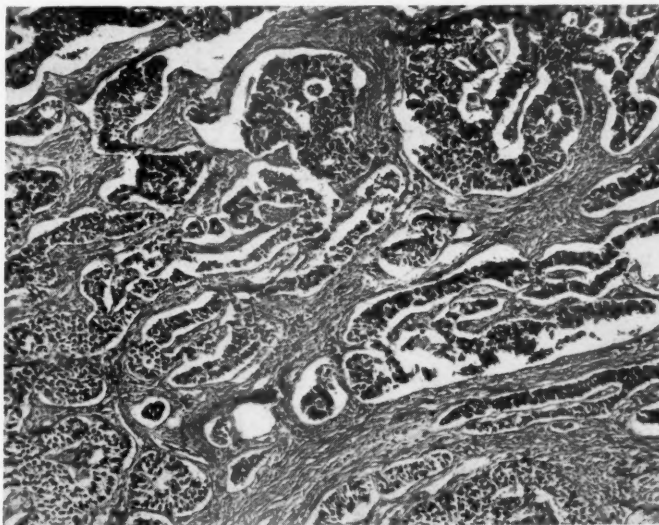


Fig. 4.—(Case 20.)

Follow-up. November 30, 1943. No indication of metastasis. Increase in weight of 22 pounds, marked increase in size of breasts; loss of much hair on abdomen, back, arms and legs, but beard still present, requiring shaving twice a week; no change in weight; some decrease in size of clitoris; vasomotor flushes 3 to 6 times daily and some night sweats. A later report (May 15, 1944) indicates that patient is living and well with no recurrence.

CASE 21.—(Dr. Robert Tennant, Hartford, Conn.) Tumor of left ovary from a woman of 65, married but never pregnant. For 1 year there had been progressive enlargement of the abdomen. The patient had always had a rather heavy beard and large clitoris, but the voice was not deep. At operation (May, 1943), 2 gallons of brownish fluid were evacuated. The tumor was partly cystic and partly solid. Supravaginal hysterectomy and bilateral salpingo-oophorectomy were done.

Classification. Mesonephroma of left ovary. (Fig. 5.)

Follow-up. Died February 23, 1944, with pelvic recurrence. No autopsy.

CASE 22.—(Dr. S. B. Pessin, Madison, Wis.) The patient was a white female of 45, with a history of enlargement of the abdomen for 6 weeks, weakness and in-

digestion. No menstrual abnormality and no sex changes. Operation (November 25, 1942) revealed a left ovarian tumor weighing about 5 pounds and measuring 22 by 19 by 11 centimeters. On section, the tumor was lobulated and showed several small cystic cavities, $1\frac{1}{2}$ to 4 cm. in diameter. X-ray showed probable metastases in the lungs.

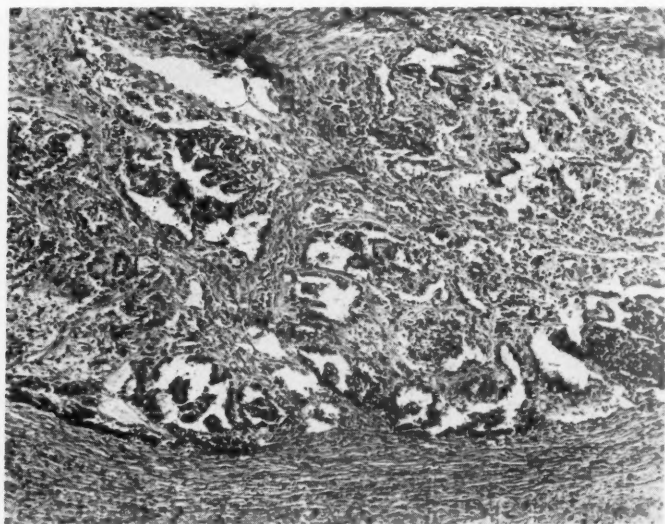


Fig. 5.—(Case 21.)

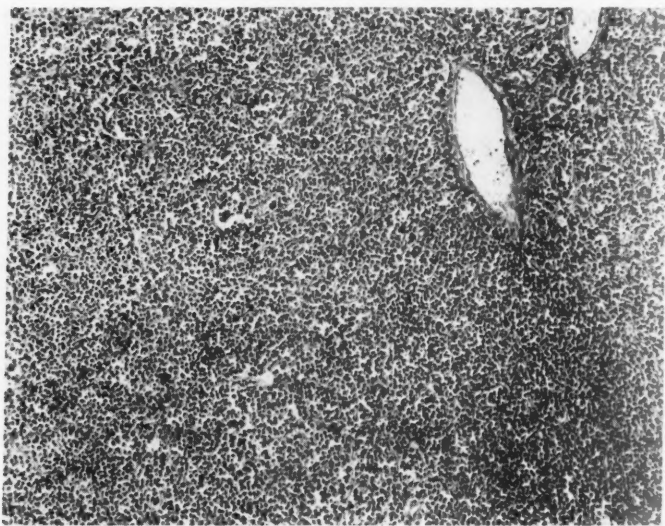


Fig. 6.—(Case 22.)

Classification. One member diagnosed lymphosarcoma, one atypical dysgerminoma, one probable dysgerminoma, one highly undifferentiated sarcoma-like arrhenoblastoma, and one was undecided between lymphoid hyperplasia, round-cell sarcoma and dysgerminoma. (Fig. 6.)

Follow-up. This patient died in November, 1943, one year after operation.

CASE 23.—(Dr. Roy W. Hammack, Los Angeles, Calif.) A large left ovarian tumor 15 cm. in diameter from a patient of 43 by Dr. J. N. Nichols on April 21, 1943. The symptoms had been abdominal enlargement, pain and some menstrual irregularity and excess. The mass was partly intraligamentous and could not be removed intact. There were some small omental nodules, up to 4 cm. in diameter. The right ovary contained a small cyst and the uterus was normal.

Classification. Adenocarcinoma of ovary.

Follow-up. Dr. Hammack reports that reoperation on November 23, 1943, showed extensive peritoneal metastasis, though patient was still living May 15, 1944.

CASE 24.—(Dr. Lester J. Bossert, Cincinnati, Ohio.) Sections of a tumor measuring 12 by 6 by 6 cm. from a colored woman of 54, whose history was that of irregular bleeding for about 6 months, beginning 8 years after the menopause. Radical operation April, 1943.

Classification. Granulosa cell carcinoma.

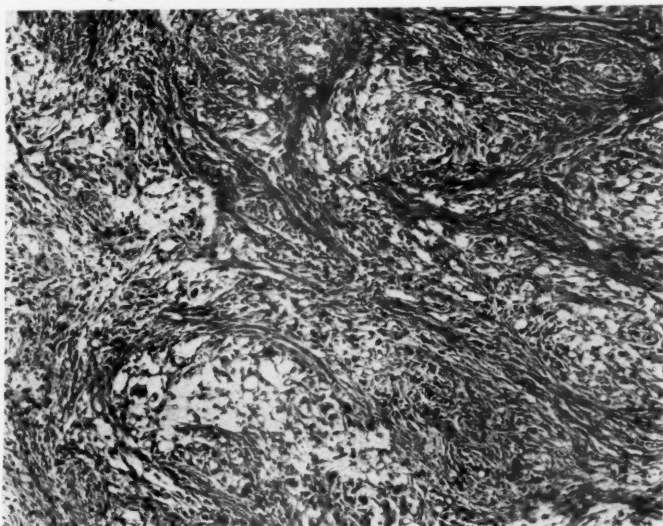


Fig. 7.—(Case 27.)

CASE 25.—(Dr. John C. Henthorne, Vicksburg, Miss.) Sections from an ovarian tumor (received June 24, 1943), removed by Dr. E. E. Robinson, Meridian, Miss., from a woman of 27. No other clinical data available.

Classification. Serous papillary cystadenocarcinoma.

Follow-up. Dr. Robinson reports that patient had deep x-ray therapy after operation, and was living and apparently well as of May 1, 1944.

CASE 26.—(Dr. Hans Benedict, Westwood, Calif.) Slides of hemorrhagic cyst of ovary removed (June, 1943) in very early pregnancy, the preoperative diagnosis being either ectopic pregnancy, or small ovarian cyst with twisted pedicle. Menstruation was three weeks overdue, with an acute onset of pain and tenderness.

Classification. Corpus luteum of pregnancy, old corpus luteum cyst.

Follow-up. Living and well (May 15, 1944). Pregnancy not interrupted by operation, with normal full-term delivery.

CASE 27.—(Dr. Lewis C. Scheffey, Philadelphia, Pa.) Slides from a patient of 49, who had had partial gastrectomy 7 years previously for gastric carcinoma, and who had apparently been well until recently, when she developed ascites. At the operation (July, 1943) a large solid tumor of the right ovary was revealed, its pedicle

having undergone partial torsion. The left ovary showed no tumor. There were several small uterine myomas. A complete hysteromyomectomy was done, with bilateral salpingo-oophorectomy.

Classification. Krukenberg tumor of right ovary (adenocarcinoma mucocellulare) secondary to gastric carcinoma. (Fig. 7.)

CASE 28.—(Dr. David M. Grayzel, Brooklyn, N. Y.) Slides from a tumor of the right ovary in a girl of 16 with a history of abdominal pain and gastrointestinal symptoms for about 2 months, and in whom diagnostic study led to the diagnosis of cecal tumor with cecal-colic intussusception. Operation (September, 1942) revealed a sessile tumor at the ileocecal junction, but also a tumor of the right ovary which measured 7 by 6 by 3.2 centimeters. The structure and microscopic appearance of the intestinal and ovarian tumors were identical.

Classification. Lymphosarcoma of right ovary, secondary to intestinal lymphosarcoma. (Fig. 8.)

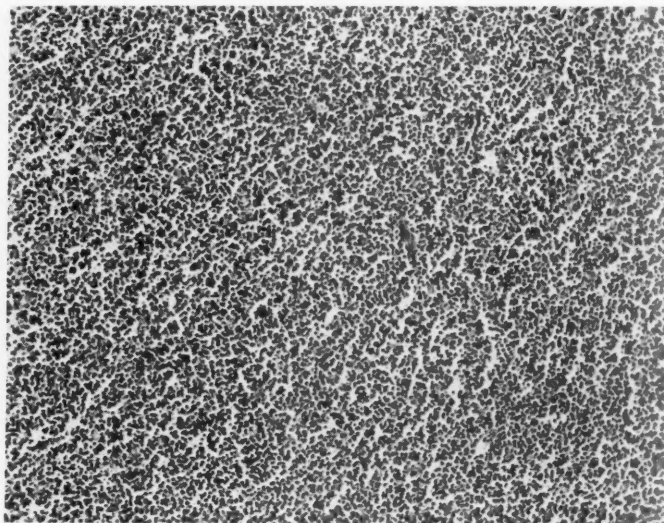


Fig. 8.—(Case 28.)

Note: Dr. Grayzel later reported that a similar tumor recurred in the left ovary, and was removed with panhysterectomy in July, 1943, ten months after the first operation. The patient was apparently well in September, 1943 (subsequent follow-up note to be obtained).

Follow-up. Patient perfectly well on May 1, 1944.

CASE 29.—(Dr. Lester J. Bossert, Cincinnati, Ohio.) An ovarian tumor (received September, 1943), 20 cm. in diameter from a patient of 22, whose history was said to be entirely negative except for the presence of some lower abdominal enlargement, noted a few weeks previously. The pelvic organs were normal except for the unilateral tumor.

Classification. Dysgerminoma of ovary.

CASE 30.—(Dr. Lawrence Chaffin, Los Angeles, Calif.) An ovarian tumor 7 cm. in diameter, with a light-yellowish friable cut surface, in a patient of 50 who entered the hospital in shock, with severe abdominal pain beginning 5 hours previously. The previous history was negative except that menstruation for the past 10 years had been somewhat more profuse than formerly. Operation on August 15,

1943, disclosed the right ovarian tumor, the left ovary being normal. The abdomen contained 3,000 c.c. of liquid blood and 1,000 c.c. of clots, the source being a 5 cm. gaping tear on the surface of the tumor. There was no history of trauma or unusual exertion, save possibly straining at stool a short time before the onset.

Classification. Granulosa cell tumor of right ovary. (Fig. 9.)

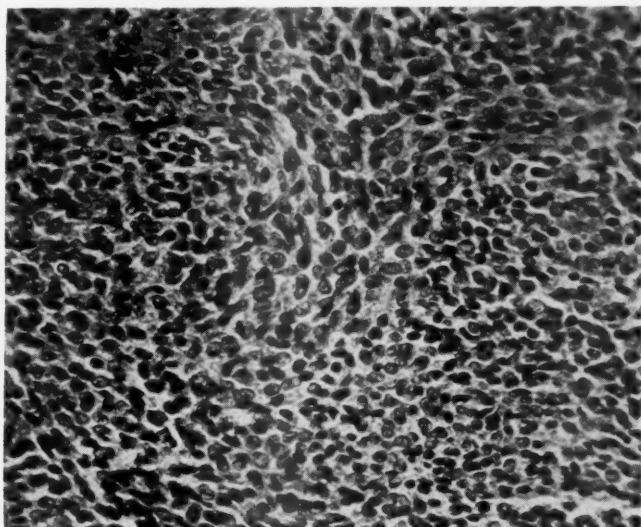


Fig. 9.—(Case 30.)

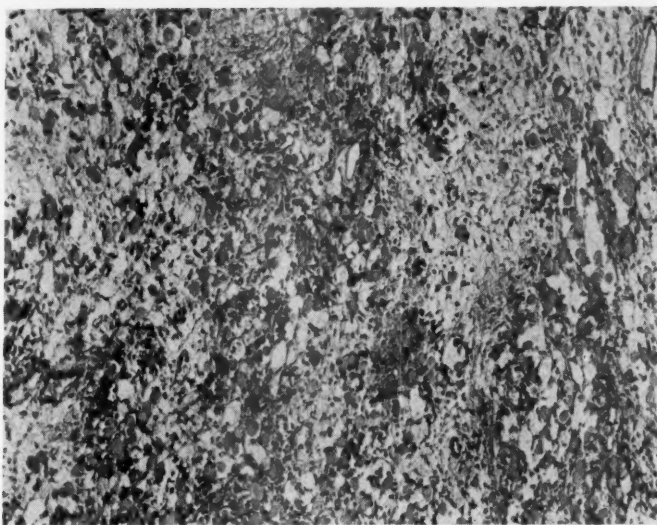


Fig. 10.—(Case 31.)

CASE 31.—(Dr. J. M. Moore, San Antonio, Tex.) A tumor of the left ovary, measuring 6 by 5 by 5 cm. removed from a patient of 36, who had been having severe pain in the left humerus for 1 year, although x-ray study showed no bone pathology, according to her physician, Dr. K. B. Round, of San Angelo, Texas. The gastrointestinal history was said to have been entirely negative. Menstruation had

always been normal except for menorrhagia with the last period, August 3, 1943. Dr. Moore reports that at operation, on August 15, 1943, a left ovarian tumor was found.

Classification. Krukenberg tumor of left ovary. (Fig. 10.)

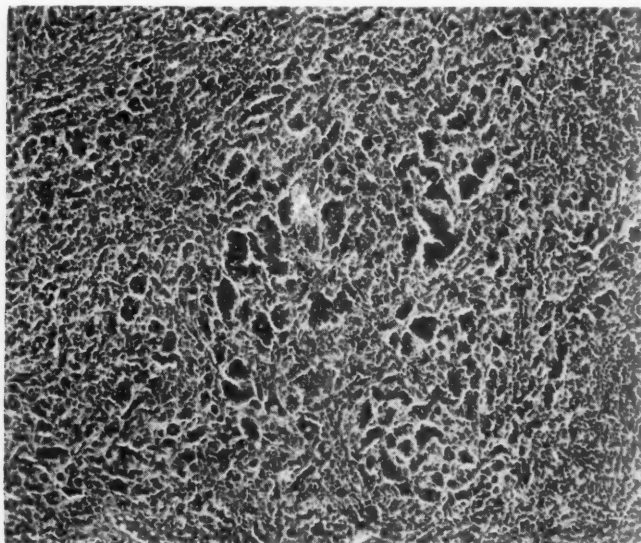


Fig. 11.—(Case 32.)

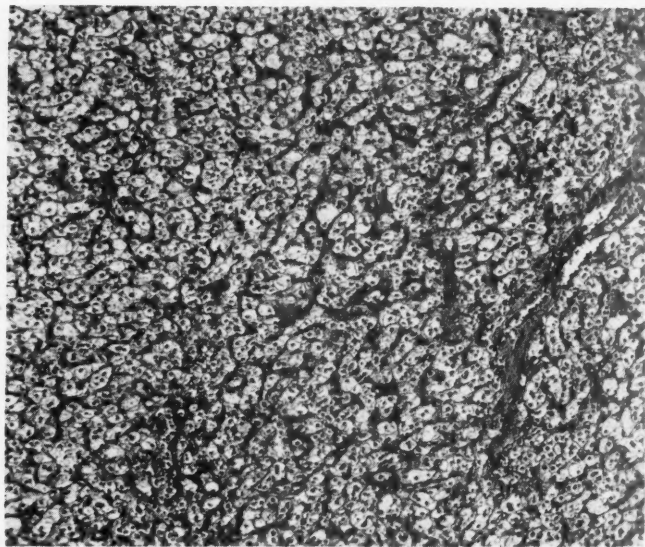


Fig. 12.—(Case 33.)

CASE 32.—(Dr. William E. Ehrich, Philadelphia, Pa.) Slides from a right ovarian tumor 12 by 10 by 5.5 cm., removed from a colored patient of 49, whose complaint was of menstrual irregularity (intervals 2 to 6 weeks) and menorrhagia with some periods, though others were scanty. A firm pelvic mass reaching to the umbilicus was thought to be a fibroid uterus, but operation September 26, 1943, revealed a solid ovarian tumor. A right salpingo-oophorectomy was done.

Classification. Granulosa cell carcinoma of right ovary. (Fig. 11.)

Follow-up. No information since October 8, 1943, when patient was in good condition.

CASE 33.—(Dr. Philip Rosenblatt, Brooklyn, N. Y.) A tumor of the right ovary from a 31-year-old prostitute with gonorrhea and syphilis. She had had amenorrhea for 10 years, with the development of typical masculinizing symptoms, including marked hirsutism (daily shaving), deep voice, and enlarged clitoris. Urinary studies revealed 23.1 mg. androgen excreted in 24 hours, with no prolan or estrone. A tumor mass was palpable in the left ovarian region. At operation (November, 1943) this proved to be a dermoid cyst 5 cm. in diameter, and this was removed.

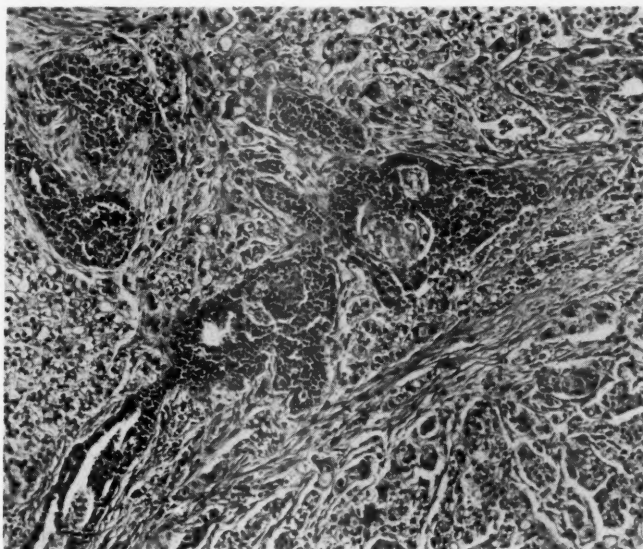


Fig. 13.—(Case 34.)

The right ovary, however, was found to be the seat of a soft mass 8 cm. in diameter, and this was removed with most of the ovary. On hemisection, the surface was soft and bulging, and of bright-orange hue, surrounding a central depressed area of firmer gray tissue. Later study revealed a small dermoid cyst in this ovary also, in addition to the above described mass.

Classification. Adrenal tumor of right ovary, with bilateral dermoid cysts (coincidental). (Fig. 12.)

Follow-up. Patient living and well. Androgen negative; estrogen 4.8 mg. (March 3, 1944).

CASE 34.—(Drs. James M. Wilson and C. C. Douglass, Durham, N. C.) Sections, with very complete clinical history, autopsy protocol and photographs from a widely metastasizing tumor, presumably of ovarian origin, in a colored patient of 49, the original diagnosis being dysgerminoma. The chief points in the history were a skipping of alternate menstrual periods, for 6 months before admission, and the appearance of a lower abdominal mass 3 months before she entered the hospital. Later, there was considerable pain and a loss of weight of something like 30 pounds. After thorough study, an exploratory laparotomy was done, revealing a large adherent mass in the region of the left ovary, the uterus being enlarged and studded with tumor masses, as was the undersurface of the diaphragm. It was possible to

remove the left adnexa but not the uterus or the right-sided mass, because of their extreme fixation. The patient died on the third postoperative day. The autopsy showed the left-sided mass, as above described, apparently replacing the left ovary. There were about 1,000 c.c. of fluid in the abdominal cavity. Metastases were present on the intestines, in the left kidney and adrenal, the uterus and at various other points. The microscopic appearance of the tumor is shown in Fig. 13.

Classification. Here again, it is necessary to record wide variations in opinion. Two members agreed with the original diagnosis of dysgerminoma, although one of these expressed doubt of this because of the papillary structure seen in the pulmonary metastases. Another states, "It is certainly not a dysgerminoma," his own impression being that the tumor is a medullary carcinoma, of unknown origin. A fourth considers the growth is "neither a primary ovarian nor uterine tumor," but that it is of primary peritoneal origin—"mesothelioma peritonei malignum." The fifth diagnosed metastatic ovarian carcinoma from an indeterminate primary situs.

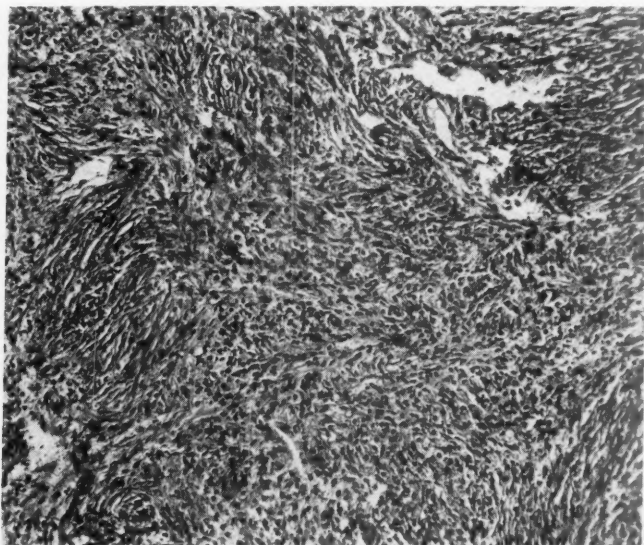


Fig. 14.—(Case 36.)

CASE 35.—(Dr. David B. Cheek, Baltimore, Md.) This patient, a 49-year-old colored woman, had had a normal menopause 3 years previously. A four-day period of menstruation-like bleeding recurred 3 months before admission and again 4 days before she entered the hospital. A left-sided mass, irregular, nodular and adherent, was made out on pelvic examination. Operation on October 26, 1943, showed the pelvis filled with a friable, lobulated mass apparently arising from the lateral pole of the left ovary. It was not possible to remove the tumor mass completely, because of its invasion into the tissues of the lateral pelvic wall and elsewhere.

Classification. Granulosa cell carcinoma.

Follow-up. Has received deep x-ray therapy, but general condition poor on May 1, 1944.

CASE 36.—(Dr. Lawrence Parsons, Reno, Nev.) Sections from a small ovarian tumor (received September, 1943), 2.5 cm. in diameter from a patient of 34 whose only symptom was irregular bleeding. The flow was described as persisting for 5 to 7 days, with cessation for only a few days, and again recurrence of bleeding, this sequence having been present for the past year.

Classification. Thecoma (Loeffler-Priesselt tumor). (Fig. 14.)

Follow-up. Living and well, with no recurrence (May 15, 1944).

CASE 37.—(Dr. Edward L. Krieg, Baltimore, Md.) Slides from the ovary of a patient of 37, an unmarried Catholic Sister, who had had hysterectomy and unilateral salpingo-oophorectomy October 1, 1943, because of profuse functional bleeding. As there was also considerable abdominal discomfort, x-ray study of gastrointestinal tract and other studies had been made, all with negative findings, a diagnosis of

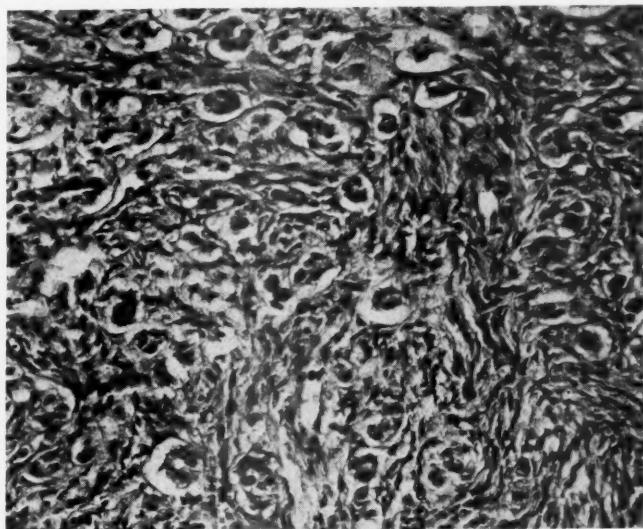


Fig. 15.—(Case 37.)

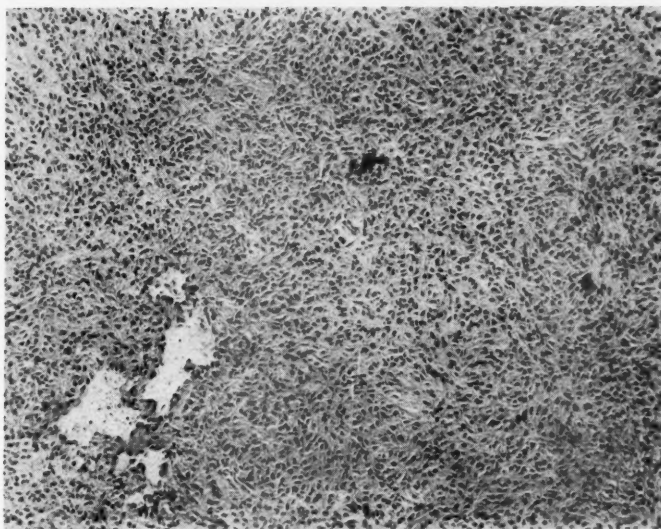


Fig. 16.—(Case 38.)

probable chronic recurrent appendicitis being made and appendectomy included in the operation. Palpation of abdominal organs at operation showed no evidence of any neoplasm. The ovary was grossly normal, the lesion under study being of microscopic nature. Its appearance is shown in Fig. 15.

Classification. One member made a diagnosis of granulosa cell tumor as did a second who affixed a question mark to this diagnosis, and later sent in a revised

diagnosis of metastatic adenocarcinoma from some other site, possibly the stomach. Three other members were inclined to the impression of metastatic adenocarcinoma, although one of these wondered if it could not be an arrhenoblastoma.

Follow-up. Patient died of pneumonia 1 week after operation. No autopsy.

CASE 38.—(Dr. John E. Hobbs, St. Louis, Mo.) Slides (received September 20, 1943) from a patient of 78, who for 4 months had had increasing weakness and pallor, with swelling of the lower abdomen. There had been no bleeding since the menopause at the age of 52. At operation (Dr. F. P. McNalley), a large seminuerotic and semicystic tumor of the right ovary. It was very friable, tearing in removal, permitting the escape of about 500 c.c. of dark bloody fluid. There were numerous small metastases studding the pelvic peritoneum. The microscopic appearance is shown in Fig. 16.

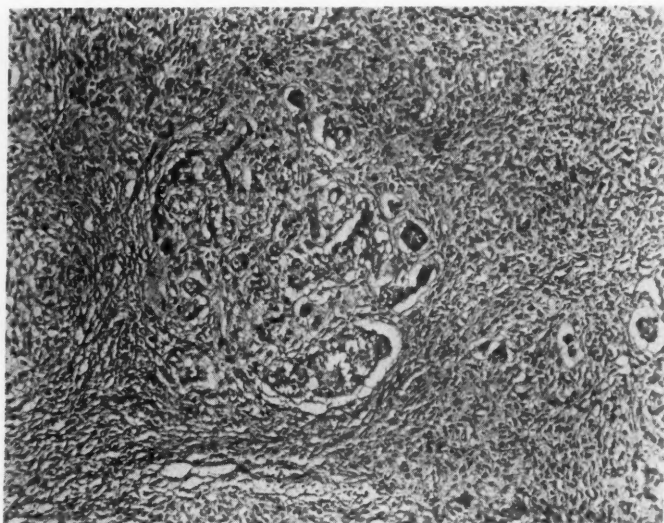


Fig. 17.—(Case 41.)

Classification. One member diagnosed malignant thecoma, one sarcoma, one fibroma and one considered it "unquestionably a malignant dysgerminoma." The fifth member first called the tumor neurinoma, but after further study, changed this to glioma of teratomatous origin.

Follow-up. Dr. McNalley reports that examination April 29, 1944, showed patient living and well, with no sign of recurrence and gain of 5 pounds in weight.

CASE 39.—(Dr. W. D. Stovall, Madison, Wis.) A large cystic ovarian tumor removed from a woman of 46. No clinical data. Slides received December 16, 1943.

Classification. Cystic fibroma of ovary.

CASE 40.—(Dr. W. D. Stovall, Madison, Wis.) A tumor about the size of a lemon in a 26-year-old woman. The ovary was apparently not itself involved, as the tumor was attached to it by a pedicle. The growth had a yellow color, "as if there were fat around it, but the cut surface did not have usual yellowish appearance of thecomas." Slide received December 16, 1943.

Classification. Fibroma of ovary with edema and necrosis.

CASE 41.—(Dr. W. D. Stovall, Madison, Wis.) An ovarian tumor weighing 2,000 Gm., essentially solid, but containing some cystic spaces. Slides received

December 16, 1943. The patient was 19, and suffered with dyschondroplasia and hemangiomas (Maffucci's syndrome). She had fairly well-developed secondary sex characters, but had been amenorrheic for 9 months before laparotomy.

Classification. Three members diagnosed mesonephroma of the ovary, one granulosa cell carcinoma and one teratoma. (Fig. 17.)

Follow-up. Patient living and apparently well May 1, 1944.

CASE 42.—(Dr. David R. Meranze, Philadelphia, Pa.) A tumor of the left ovary (received December 15, 1943) from a woman of 42, unmarried, with a history of pain in the left lower abdomen, no menstrual disorder, no feminizing or masculinizing changes. The tumor was a multilocular cyst 11 by 10 cm. to which was intimately attached a large strikingly orange-yellow solid tumor 7 by 5 by 3 cm. in size.

Classification. Pseudomucinous cystadenoma with fibroma.

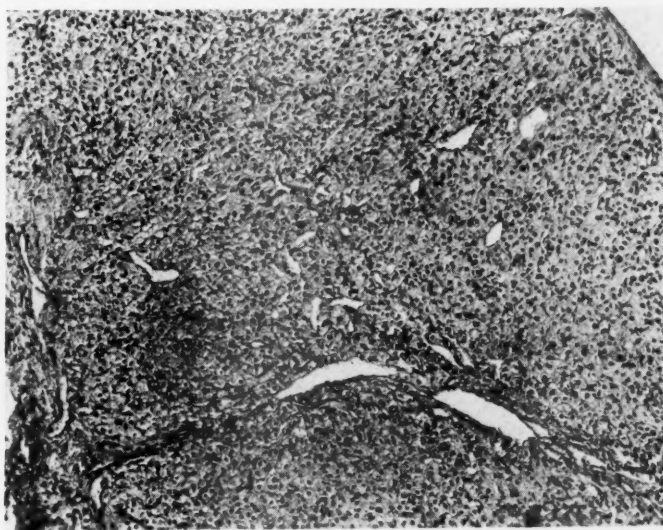


Fig. 18.—(Case 44.)

CASE 43.—(Dr. John C. Henthorne, Vicksburg, Miss.) Biopsy sections obtained January 6, 1944, from an ovarian cystic tumor with warty nodules in its wall. The patient was a colored woman of 43, no other data being available.

Classification. Serous papillary cystadenocarcinoma.

CASE 44.—(Dr. Joseph A. Burket, Louisville, Ky.) Sections and tissue from a tumor (received December 18, 1943) in a 36-year-old woman who had noted enlargement in her abdomen and who had lost 40 pounds in weight during the preceding year, presumably through dieting. She had not menstruated since the birth of her second child 16 years before. Shortly after this childbirth, she had developed heavy hirsutism, requiring daily shaving. The abdomen was filled with a multinodular tumor, arising from the left ovary. The preoperative diagnosis was arrhenoblastoma. The uterus was four times the normal size, the right ovary was normal, and the liver was much enlarged, containing many large and small nodules. The spleen was five times the normal size. The ovarian tumor measured 16 by 13 by 8 cm., and on section showed numerous rounded or irregular areas of various colors, some reddish-gray, some yellow and others hemorrhagic. There was considerable stroma. Following operation the patient declined, with the development of jaundice.

and death on the eleventh postoperative day. Vaginal bleeding appeared on the ninth day, the first time in 16 years. Autopsy was not obtainable.

Classification. Adrenal tumor of ovary (hypernephroma). (Fig. 18.)

Follow-up. Patient died on eleventh postoperative day.

CASE 45.—(Dr. Clement R. Munroe, Pinehurst, N. C.) Sections from a large ovarian tumor removed in 1935 from a colored child of 6, who presented the picture of precocious puberty. After removal of the tumor, the abnormal symptoms disappeared completely.

Classification. Granulosa cell tumor of ovary. (Fig. 19.)

Follow-up. Dr. Monroe reports that a recent examination (8 years after operation) showed the girl to be entirely normal with no sign of recurrence. Menarche had occurred at 12, and there has been no abnormality of menstruation.

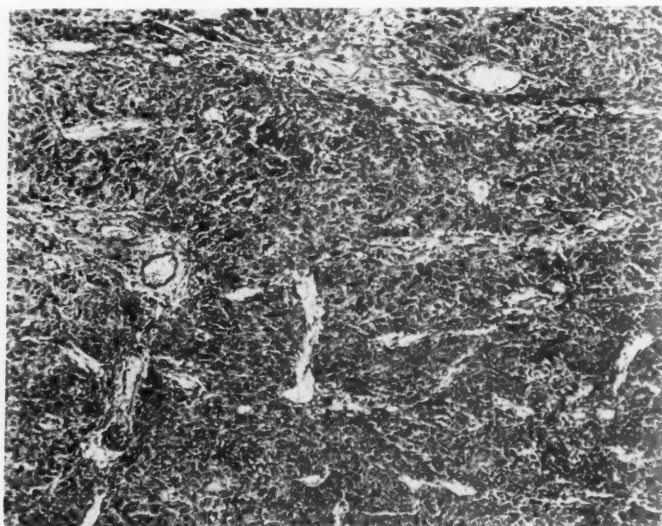


Fig. 19.—(Case 45.)

CASE 46.—(Dr. R. W. TeLinde, Baltimore, Md.) The patient, aged 27, had been operated upon in 1929 at age of 12 for a Ewing's tumor of the cranial bones, with localized recurrence in 1930, followed by secondary operation and x-ray therapy at intervals until 1935, with no evidence of further recurrence until 1942, when she developed metastases in the lungs. These have responded readily to irradiation, but have never completely disappeared. Menstruation normal until October, 1943, when she developed midinterval bleeding lasting 3 to 7 days. Examination revealed a large mass pushing the uterus anteriorly and feeling like a benign fibroid. Operation revealed a solid tumor arising from the left ovary and filling the pelvis. There were two implants at the bladder reflection of the peritoneum. No other metastases were found. Supravaginal hysterectomy with double salpingo-oophorectomy were done.

Classification. One member diagnosed metastatic Ewing's tumor, one thought the picture consistent with such a diagnosis but hesitated in giving an opinion without sections of the original tumor, one declined to offer a diagnosis because he thought the tumor too retrogressive, and one hesitantly thought it a granulosa cell tumor, and the fifth member likewise called it a granulosa cell carcinoma. (Fig. 20.)

Follow-up. General condition May 1, 1944, reported as poor by her physician in North Carolina. She has recently had several transfusions because of marked anemia.

CASE 47.—(Dr. Robert Tennant, Hartford, Conn.) An unmarried woman of 37 had noted a lump in the abdomen. No menstrual disorder except that last period had occurred one week before expected date. At operation on October 6, 1943, the tumor replaced the left ovary. It was solid, measuring 12 cm. in diameter, with irregular lobulation, and a yellowish cut surface. The remaining pelvic organs were normal. Panhysterectomy and bilateral salpingo-oophorectomy were done.

Classification. Dysgerminoma of ovary.

CASE 48.—(Dr. A. L. Pietrolongo, Philadelphia, Pa.) Tumor 5 cm. in diameter replacing one ovary (received July 13, 1943). It was stony hard, lobulated, well encapsulated, with a dense yellowish-brown and trabeculated cut surface. The tumor was found at operation for multiple fibroids of the uterus, the patient being 47 years old.

Classification. Brenner tumor.



Fig. 20.—(Case 46.)

CASE 49.—(Dr. Lawrence Wharton, Baltimore, Md.) A large tumor of the left ovary, involving the sigmoid, removed from a woman of 58, on February 19, 1944. Radical removal of the pelvic organs, with resection of 15 cm. of sigmoid. The right ovary was normal, but omental metastases were present.

Classification. Granulosa cell carcinoma of ovary.

Follow-up. Patient still in good condition June 1, 1944 (only 3½ months after operation).

CASE 50.—(Dr. Caspar G. Burn, Brooklyn, N. Y.) The patient, aged 53, was admitted first on May 10, 1943, again on July 21, and once more on September 28. There was a lower abdominal mass which had increased since her first examination. Operation on December 13, 1943, revealed a large adherent ovarian cyst containing 2 liters of bloody fluid. Supracervical hysterectomy, right salpingo-oophorectomy and left salpingectomy were done. Postoperatively the patient went into shock and died on January 8, 1944.

Classification. Granulosa cell carcinoma of ovary.

Follow-up. Patient died on twenty-sixth postoperative day.

Comment

While the work of the Committee on Ovarian Tumors is as yet in its very infancy, it is already evident that its possibilities are great, and that it is worthy of the cooperation of all gynecologists and pathologists. Plans are under way to publicize the project more widely through direct appeal to many who should be in a position to supply much of the kind of material which is being sought. It should be emphasized that it is not only the rare tumors or those presenting difficulties in diagnosis which are appealed for. To illustrate, the very common serous papillary cysts are of special interest because of the frequent uncertainty of prognosis, not to speak of the considerable group of these cases in which pathologists will differ as to the diagnosis of histologic malignancy or nonmalignancy.

The best possible clinical data and the best possible material for study, in the form of slides, blocks of tissue or entire specimens, are desirable, as has been emphasized in the various announcements issued by the Committee. Finally, to quote from the last of these, "The Registry is to be looked upon as a cooperative project among the gynecologists and pathologists of the country, and it is earnestly hoped that all will develop the routine of sending material from all interesting ovarian tumors, with adequate clinical data to the Committee for study and registry."

26 EAST PRESTON STREET

Discussion

DR. JOE V. MEIGS, BOSTON, MASS.—To me this first glimpse of the Ovarian Tumor Registry has been very enlightening. The number of doctors participating and their geographical distribution shows with what importance the whole country looks upon such an endeavor. No doubt, after the publication of the Committee's report, a great many more cases will come to the Registry for consideration.

The value of having histories, pieces of tissue and follow-up is borne out by the cases presented today. For years, I have doubted the frequency of granulosa cell tumors of the ovary but in this group of 50 cases granulosa cell tumors comprise 18 per cent, and with thecomas added, 26 per cent. This is fairly good proof that these tumors are much more frequent than I have ever suspected. It had been my opinion that they represented but 5 per cent of the ovarian tumors, exclusive of the simple cysts.

I have also been impressed by the apparent lack of radical surgery in these cases. It is my opinion, that in a suspected case of cancer of the ovary, bilateral oophorectomy and total hysterectomy ought to be carried out if at all possible. Cancer of the ovary is, or will be, bilateral in at least 40 per cent of cases and therefore bilateral oophorectomy is essential. In the definitely endocrine type of tumor, radical surgery is not necessary for in these metastases are few, if the tumor has not already become adherent. Endocrine tumors are not frequently bilateral.

I am delighted with the report and feel that the Registry should be encouraged to continue its fine work. Important clues as to the histogenesis, proper treatment and prognosis must be forthcoming from such a wonderful group of tumor cases.

DR. JOHN L. McKELVEY, MINNEAPOLIS, MINN.—This is a difficult paper to discuss if one is to speak of the material that has been presented. It is probably correct to say that most of the members of this Society have been curious to know of the progress of the Ovarian Tumor Registry, and that they have sincerely hoped that it might take its place as a source of useful information. There is reason

to believe that this hope will be justified. Dr. Novak has drawn attention to the experiences of the initial period of the Registry's activity. These have produced some surprises and some useful lessons have been learned.

It would seem clear that a well-organized Ovarian Tumor Registry is worthy of the sponsorship given by this Society and of the considerable efforts put forth by the members of the Committee responsible for it. As such, it merits the participation of the members of the Society as a whole. Perhaps the Society is awaiting the example of the members of the Committee themselves.

The aims of the Ovarian Tumor Registry are clear. Too much time must elapse before the material of any single clinic may be expected to produce an adequate sample of the rare and more interesting tumors. To have these available in large numbers for study is obviously desirable. Certain requirements should be satisfied, however, if the material is to be useful for study purposes. The clinical requirements can probably be readily met. A careful and complete clinical history, accurate description of the findings at surgery and prolonged follow-up or autopsy report are not difficult to obtain.

Dr. Robert Meyer who is one of the members of your Committee has asked me to bring to your attention some features of the organization of the Registry which bear particularly upon the histological problems.

The material which has been coming through is made up largely of already stained and mounted sections. A very large part of this is astonishingly poorly prepared. Diagnosis is difficult enough, and much of it is useless for study. It does not appear to be widely recognized that many ovarian tumors show extensive variations in different areas, and that patient search of the tumor may be essential to a proved decision. Careful and often multiple differential staining may not infrequently be necessary. Any future study will certainly require that adequate amounts of fixed tissues be available. Altogether, it would seem wise to suggest that the policy of collecting only already prepared sections be changed. Better results could be obtained if a collecting laboratory were to request reasonable samples of the original material, and to prepare it adequately. The direct availability of unstained sections would greatly aid the members of the Committee in arriving at an objective conclusion. This is no field for guessing, and poorly prepared material may present hazards which can lead to little else.

This is not the place to argue about the details of differences of opinion in the interpretation of the material presented. It might, however, be suggested that the Committee could perform a useful function if it could find a basis for agreement upon certain moot points in the ovarian tumor field. The vexing problem of the confusion which exists as between the fibroma and the theca-cell tumor does not appear to be insoluble. The term Krukenberg tumor is used in this report in a sense which will bear examination. At least, some sort of agreement or understanding is desirable. And finally, if for no other reason than for the sake of the worried student, it would be well to agree upon the spelling of dysgerminoma.

Dr. Novak and his Committee have conscientiously carried out the organization of what promises to be a productive and interesting enterprise. I should like to express an appreciation of their efforts and an interest in their work.

The second installment of the American Gynecological Society Transactions will appear in the January, 1945, issue of the JOURNAL.

Department of Reviews and Abstracts

Selected Abstracts

Radiation

Thomas, Sydney: Diffuse Calcification of the Placenta Demonstrable in Vivo, *Radiology* 41: 573, 1943.

The author describes a case of diffuse calcification of the placenta demonstrable by x-ray and the use of a new technique. It is felt that with this method other special procedures such as iodide or air cystography may be eliminated in the roentgenologic diagnosis of placenta previa.

WILLIAM BERMAN.

McIntosh, Harriet C.: Roentgen Therapy of Pelvic Tuberculosis in the Female, *Radiology* 42: 48, 1944.

The author considers only surgical and radiation therapy in his discussion. In regard to roentgen therapy, treatment should not be given merely because of a presumptive diagnosis of tuberculosis. An adequate diagnosis should be made either by curettage or by laparotomy. The use of surgery and its limitations are mentioned. Limitations in regard to x-ray therapy are also stated. X-ray has no effect on pyosalpinx, ascitic fluid or abscess material. It is of value in the dry form of peritonitis, or after the fluid has been removed postoperatively. Protection of the ovaries should be considered in the technique of treatment during the child-bearing period. In advanced tubal-peritoneal disease, the combined radiologic and surgical treatment is indicated. The worst prognosis is in cases with severe disease elsewhere. Different techniques of various authors are mentioned. The author reports 11 cases with 6 patients clinically free of disease 1 to 3 years, and 4 more showing local improvement.

WILLIAM BERMAN.

Maxfield, Jr., J. R., McIlwain, A. J., and Robertson, J. E.: Treatment of Radiation Sickness With Vitamin B₆ (Pyridoxine Hydrochloride), *Radiology* 41: 383, 1943.

After perusal of the literature in regard to vitamin therapy for radiation sickness, the authors tried pyridoxine hydrochloride intravenously. They began by giving 25 mg. intravenously every day, only in cases in which radiation sickness was definitely present. In many cases, only one dose was necessary to stop the unfavorable symptoms. The authors now recommend that after the onset of radiation sickness 25 mg. be given intravenously immediately, and repeated at intervals of twenty-four to seventy-two hours as needed throughout the remainder of the treatment series. This particular treatment does not preclude the use of such other medications as may be needed. The use of liver extract, a high vitamin intake, sedatives, etc., are to be used when indicated.

WILLIAM BERMAN.

Miscellaneous

Leftwich, William B., 1st Lt. U.S.M.C.: An Intradermal Test for the Recognition of Hypersensitivity to the Sulfonamide Drugs, Bull. Johns Hopkins Hosp. 74: 26, 1944.

A method has been described by which positive skin tests may be obtained in patients who have shown hypersensitive reactions to the sulfonamide drugs. The material used for the skin test consisted of serum obtained from patients who were receiving a sulfonamide therapeutically and contained a drug level of from 2 to 25 mg. per cent. This skin test is simple to perform, may be easily and quickly interpreted, and was found to be reliable in the diagnosis of drug sensitivity in 28 out of 30 cases of definite drug reactions. It is hoped that this test may be useful, both in the differential diagnosis of drug reactions, and perhaps as a precautionary measure before starting sulfonamide therapy in patients who have previously received one of these compounds. The fact that positive skin tests may be so consistently obtained in sensitive individuals is additional evidence that drug sensitivity is an allergic reaction. The sensitizing antigen may be a sulfonamide plasma protein combination which occurs in vivo in the circulating blood of patients during sulfonamide therapy, the sulfonamide perhaps acting as a haptene. The failure of two patients in the experiment who developed hepatitis, and one patient who developed hemolytic anemia as a result of sulfonamide therapy, to show positive skin reactions for the homologous sulfonamide, supports the belief that these latter reactions are due to direct toxic action of the sulfonamide rather than to hypersensitivity.

C. O. MALAND.

Brown, Willis E., Gunderson, Millard F., Schwartz, Pauline, and Wilder, Violet M.: A Clinical and Bacteriologic Study of Phemerol as a Skin Antiseptic, Surg., Gynec. & Obst. 78: 173, 1944.

The authors present a series of studies on the comparative value of various skin antiseptics in common use surgically. Of particular interest was one of the detergent group, namely phemerol. The technique used in the study was based on the use of small blood agar plates placed on the abdomen, and then removed at half-hourly intervals and incubated at 37° C. for 48 hours. The count of the number of colonies gave an index of the effectiveness of the antiseptic. A basic wash of green soap and alcohol was applied to the whole abdomen. One-half only was painted with the substance to be tested, the other serving as a control. When tested by this method, phemerol was found to be superior to the mercurials studied, but about equal to tincture of iodine.

L. M. HELLMAN, LT. M.C., U.S.N.R.

Lee, Roger I.: Geriatrics: The Medical Care of the Elderly, New England J. Med. 230: 190, 1944.

In a beautiful and humorously worded article, the author takes up the subject of geriatrics, pointing out its great importance and the fact that it is at the stage where pediatrics was a generation ago.

Advances in medicine and public health which apply almost entirely to infancy and youth, have lengthened the average expectation of life to 64 years to a person born in 1943. But the added years really represent a salvage of infants and youths, not of adults.

The author points out in his early days as a physician, old people were stored away so to speak in lace caps or bedroom slippers and not permitted any social activities. He welcomes the modern trend in the opposite direction, but deplores the

extremes. He enumerates the degenerative processes which accompany old age, the diminution of the secretions of the alimentary tract, the prevalence of gallstones and diverticulosis. He feels that diet is of great importance, aided by vitamins, and in certain selected cases thyroid extracts, iodides, and in special cases sex hormones.

JAMES P. MARR.

Anatomy, Anomalies, Etc.

Uranga, F. A., and Dubrovsky, I. R.: Fetus Compressus, *Semana méd.* 50: 1463-1466, 1943.

Death and retention of a twin, which is not recognized during pregnancy, are unusual and infrequent occurrences. Its retention, even to the time of parturition of the twin that develops normally, depends on the time of fetal death. If this occurs within the first three months, when the embryo contains much water and is friable, dissolution occurs. Afterward, from three to five months, mummification, and later maceration and even putrefaction occur, when microorganisms invade the uterine cavity. When the fetus becomes mummified, it is compressed between the uterine wall and the developing embryo, to form what is called fetus papyraceous or compressus.

In a series of 61,998 births, the authors found three instances of fetus compressus. In the same series there were 929 sets of twins. In all three instances, the pregnancies were dizygotic and in all, continuation of strong contractions revealed unexpectedly the presence of a mummified fetus. All showed development of an embryo at about three months. In two cases, a living normal infant was delivered. In the third, the fetus was stillborn at about eight and a half months. In no instance had there been any unusual symptoms during gestation to suggest such an occurrence.

Fetal death in these cases is usually explained on the basis of difficulty of nutrition of twins. The changes that occur have been described by Lempereur. The fetus dies in the amniotic cavity like fruit in alcohol. The tissues contract and condense, the embryo decreases in size, and is reduced to a fragile shell, and becomes hard and dry. The fetus takes on a yellowish-gray color. The amniotic fluid disappears by absorption and deposits a sediment on the fetus. Usually discovery of a fetus compressus is not made until parturition.

J. P. GREENHILL.

Quisenberry, Walter B.: Spina Bifida and Polydactylism in One-Egg Twins, *Virginia Monthly* 71: 303, 1944.

Twins born to a Negro woman in her third pregnancy after two normal deliveries of normal babies is reported. The twin babies were similar in that each weighed 4 pounds, each possessed two erupted incisor teeth, and each had a spina bifida with meningocele of the same extent. They differed in that one had a well-developed polydactyle (thumb). The twins were undoubtedly single ovum as evidenced by the similarity of their defects with the exception of the polydactylism, and there was a single ovum with no amnion between the babies in utero. Both died shortly after birth. Some theories as to possible etiology of spina bifida are presented.

WILLIAM BICKERS.

Trotter, Mildred and Letterman, George H.: Variations of the Female Sacrum: Their Significance in Continuous Caudal Anesthesia, *Surg., Gynec. & Obst.* 78: 419, 1944.

Six hundred and seventy-four sacra from white and Negro females were examined. The variations in length and diameter of the sacral canal and measurements of the

hiatus are described. Certain abnormalities of the canal and hiatus which would make the use of continuous caudal anesthesia difficult or impossible are demonstrated by photograph and anatomic description. In 45 per cent of the pelves, the upper end of the hiatus reached a level cephalad to the lower third of the body of the fourth sacral vertebra. Theoretically, this reduces the distance from the highest possible point of insertion of the needle and the inferior limit of the subarachnoid space. In 22 per cent, there were congenital deficiencies in the dorsal wall of the canal which might permit the exit of the needle, and thus a failure of the anesthesia. In 5.5 per cent, the anteroposterior diameter of the canal was less than that of the needle commonly used, making a caudal impossible.

L. M. HELLMAN.

Rodiles, A. Q.: The Pelvis of Mexican Women, Obst. y. ginec. latino-am. 1: 466-470, 1943.

From an extensive study over a period of 20 years, the author comes to the conclusion that in spite of the small size of the Indian females in Mexico, their pelves are as normal as those of white women. Contracted pelvis is rarely found and normal labor is almost invariable.

J. P. GREENHILL.

Anesthesia, Analgesia

De Araujo, J. Onofre: Particularities of Anesthesia in Obstetrics. Consideration of 886 Anesthesias During the Five-Year Period of 1939 to 1943, An. brasil. de ginec. 16: 428-437, 1943.

According to the author the use of anesthetics in obstetrics differs from that in surgery, and he emphasizes the difficulty of selecting a good anesthetic for all purposes because of the conflicting interests of mother and baby. He distinguishes between analgesia and anesthesia.

Regarding analgesia, he calls attention to the danger of administering drugs to relieve the pain because of their bad effects on the respiratory center of the newly born; morphine, especially, must never be given during the two or three hours preceding delivery. The use of so-called twilight sleep and of continuous caudal analgesia was discontinued because of the unreliable results obtained in their experimental applications. In selected cases, nitrous oxide may be permitted during the second stage of labor, provided that it is administered by an expert anesthetist and under the supervision of the obstetrician.

Regarding anesthesia, the author advocates the use of spinal anesthesia in cesarean section because it favors uterine retraction; however, owing to the risk of death of this anesthesia which seems to be unavoidable and caused by the introduction of the drug into the subarchnoid space, peridural anesthesia was used with good results. General anesthesia with ether is indicated for version and is also recommended for short operations. The author claims advantages for cyclopropane and advises against the use of nitrous oxide for long periods because it leads to dangerous anoxemia of the fetus; with cyclopropane, anoxemia does not develop, as so much oxygen has to be used with it. When cyclopropane is not available, ether should be used with nitrous oxide induction. In cesarean section, extraction by forceps or the management of normal labor when episiotomy is necessary, local infiltration is recommended as an efficacious method which offers no danger for mother and child.

J. P. GREENHILL.

Magalhaes, D.: Continuous Caudal Analgesia of Hingson and Edwards, Rev. de ginec. e d'obst. 37: 221-250, 1943.

The author is the first in Brazil to report the results of this method which was used in 10 labors. In general, the results were satisfactory and encouraging. The

total duration of labor was shortened: the first and third stages were shorter, while the second was greatly facilitated and could also be of shorter duration if intelligently controlled.

There was one fetal death which, from the results of the autopsy, could not be attributed to the technique of the analgesia. In another case, intervention was necessary because of fetal suffering. The intervention consisted of a high application of forceps in a primipara. The author thinks that such a dangerous operation could never have been crowned with the success it had, if there had not been absolute relaxation of the soft tissues given by the technique of analgesia which facilitated his work to the highest degree.

J. P. GREENHILL.

Leon, J.: Obstetric Analgesia With Barbiturates, *Semana méd.* 1: 1260-1263, 1943.

The author reiterates results in a previously published study which he feels has been misinterpreted by others, and restates his opinion regarding the efficacy of barbiturates in obstetrics. Only 30.5 per cent of patients experienced complete analgesia and amnesia, without any complications. These represented the optimal results obtained. The remaining cases were divided into six groups, according to whether the analgesic-amnesic effect was complete, but accompanied by untoward effects; or whether it was relative. The worst results were represented by two cases in which there was no analgesic or amnesic effect, but toxic symptoms.

Although barbiturates certainly do not constitute a panacea for relief of pain in all obstetric cases, the author believes that results obtained with these preparations are no worse than with other drugs used for this purpose. On the contrary, satisfactory results are being obtained, particularly when barbiturates are combined with gas anesthesia.

His final conclusions, cited from his previous paper, are: The most satisfactory procedure for relief of pain from the beginning of labor consists in utilizing in the waiting period a sedative—antispasmodic or hypoanalgesic—for amnesia, whose choice will depend on various clinical and obstetric conditions; and in the period of expulsion, gases or regional anesthesia. It is difficult, actually, to admit that a single method exists, adaptable in a standard, routine form to all circumstances, and so it is necessary to proceed in this, as in all clinical problems, with eclectic acumen, choosing the method, in each case, which, from careful examination, appears most useful.

J. P. GREENHILL.

Levine, W., Herzlich, J., Halperin, J., and Taller, H.: Continuous Caudal Anesthesia in Obstetrics, *Am. J. Surg.* 64: 31, 1944.

Continuous caudal anesthesia was used in a series of 250 cases. The authors claim good results including no untoward effects upon the newborn infants that could be attributed to the anesthesia, diminution in blood loss, greatly facilitated operative procedures, and marked shortening of the first stage of labor. Several women showed mild circulatory disturbances which were easily combated. It is interesting to note that 2 cesarean sections were performed under this form of anesthesia without incident.

FRANK SPIELMAN.

Hanley, B. J.: Obstetrical Analgesia in Private Patients, *Am. J. Surg.* 54: 403, 1941.

A series of 312 private cases are reported in whom nembutal and scopolamine were used to induce analgesia. Good results were obtained in 82 per cent. Most of the patients who failed to respond were in hard labor before the analgesia was begun so

that there was insufficient time for the drugs to induce sleep. There were no maternal complications which could be attributed to the analgesia, and only one baby was stillborn due to a prolapsed cord. Twelve babies showed signs of asphyxia, but all responded to the introduction of a tracheal catheter and/or carbogen inhalations. The author emphasizes that although the combination of nembutal and scopolamine (in dosage of 6 grains and $\frac{1}{150}$ grain respectively) is safe, the patients so treated require constant supervision. The length of the first stage of labor is not increased, but the lack of cooperation from the patient during the second stage increases the incidence of outlet forceps.

FRANK SPIELMAN.

Burton, Harold: Low Spinal Anesthesia During Labor in Cases of Cardiac Failure, Brit. M. J. 4316: 389, 1943.

The author repudiates cesarean section in cardinals. He advocates natural delivery or low forceps under low spinal anesthesia using 0.6 c.c. of heavy procaine injected between the third and fourth lumbar vertebrae.

He has demonstrated the relative safety of this procedure in over 100 normal cases, and cites two illustrative cases of marked cardiac disease in which this form of anesthesia was used to alleviate pain and to eliminate the "bearing down" reflex.

He mentions headache as a complicating symptom which may persist as long as a week.

FRED L. ADAIR.

Guttman, Samuel A.: Demerol, J. A. M. A. 124: 155, 1944.

Observations are made in patients with intracranial lesions. These patients received 100 mg. of demerol parenterally. Seven of the 20 cases had a respiratory rate depression below the safe level (12 or less per minute). Instances of contracted pupils with sluggish response to light were observed.

WILLIAM BERMAN.

Gallen, Bedelia, and Prescott, Frederick: Pethidine as an Obstetric Analgesic, Brit. M. J. 4335: 176, 1944.

The pharmacology of the drug is reviewed. In the dosage employed, pethidine was an effective analgesic. It did not produce amnesia unless given with adequate doses of either barbiturates or scopolamine. Only 5 per cent of the patients failed to obtain any relief from pethidine. Analgesia was complete or satisfactory in 60 per cent. When given intravenously, it produces analgesia in 5 to 10 minutes, and when given intramuscularly, it takes effect in about 15 minutes. The duration of action is 3 to 4 hours. Intravenous administration is contraindicated in labor complicated by toxemia or hypertension. It has a definite antispasmodic action on the cervix. It prolonged labor somewhat, but there was no increase in the incidence of instrumental deliveries. Reactions in the mother included vomiting, dizziness, tingling of the limbs, and dryness of the throat. These symptoms were transient. Nine per cent of the babies so born needed resuscitation.

WILLIAM BERMAN.

Malignancies

Pineda, Julio y Porres: Papillary Adenocarcinoma of the Ovary, Rev. méd. cubana 55: 186-191, 1944.

Papillary adenocarcinoma of the ovary is discussed, with a case report by the author. This is the most frequent type of malignant tumor of the ovary and

shows the least satisfactory postoperative results. Only about 15 per cent of patients survive more than five years. Prognosis is largely dependent on the grade of malignancy. Statistics show that in grade 1 adenocarcinomas, the five-year survival rate is about 38 per cent and about 27 per cent in the pseudomucinous type, as compared with 4 per cent and 0 per cent respectively in grade 2 and grade 3 adenocarcinoma.

Radiotherapy is also an important factor. In comparing a series of 82 patients in which some received postoperative irradiation and others did not, 42 per cent of those irradiated with adequate dosage survived five years, and only 32 per cent of those who did not receive radiotherapy. Only 9 per cent who received inadequate radiation treatment lived five years after operation.

Nevertheless, operation yields the best results and should be carried out in every case. Only actual observation and subsequent histopathologic study of tissue permits an accurate prognosis. Later irradiation also increases the survival rate.

J. P. GREENHILL.

Dominguez, R., Sisco, R., Zamora Perez, and Agüero, O.: Hydatiform Mole Treated by Abdominal Hysterotomy, Rev. de gynec. e d'obst. 3: 139-145, Nov. 3, 1943.

The authors report a case in a woman 22, with symptoms of hemorrhage and hypogastric pain. In this case, high intervention was chosen, because of the patient's serious condition and the fact that the condition of the cervix indicated that dilatation and curettage would be unsuccessful. The authors believe, however, that Schumann's abdominal hysterotomy technique should be the exception, and never could be justified as a routine procedure in these cases. There are definite indications for its use in exceptional cases such as the one reported, in which operation by the vaginal route would entail too much risk.

J. P. GREENHILL.

Nestarez, O. B., and Franco, S. C.: Subarachnoid Alcohol Injections in the Treatment of Genital Neoplasms, An. brasil. de ginec. 17: 173-184, 1944.

The authors review the various measures used to relieve intractable pain in genital cancer including rhizotomy, cordotomy, pelvic sympathectomy, paravertebral alcohol injections, subarachnoid ammonium sulfate injections and the used opium alkaloids. The authors were particularly interested in subarachnoid alcohol injections, and they discuss the type of pain relief from all aspects such as physiology and rationale, indications, contraindications, technique, physical behavior of the alcohol in the spinal fluid, complications, etc. They used alcohol injections in 16 cases of cancer of the cervix where intractable pain was present, and they employed Stern's technique. The results were good in 7, and fair in 3. The complications observed were urinary retention in 3 cases, and paralysis of right leg in 1 case. The patients survived from 1 to 6 months.

J. P. GREENHILL.

Fels, E.: Treatment of Cancer of the Breast With Male Sex Hormone, Semana méd. 51: 166-170, 1944.

A preliminary report on three cases is presented by the author. Testosterone propionate was the preparation used. All three patients had advanced lesions. In the first two, these were recurrent, with metastases, despite surgical and radiologic treatment. The third patient refused operation but had radium treatment for a deep ulcerating lesion in an advanced stage. Satisfactory results were not to be

hoped for in any of these patients, yet all displayed relief of symptoms after receiving testosterone propionate.

J. P. GREENHILL.

Tuchschmid, G.: Chorionepitheliomas: Two Cases With Negative Aschheim-Zondek Reactions, Schweiz. med. Wehnschr. 73: 1493-1495, 1943.

It has already been pointed out that it is possible to have a negative Aschheim-Zondek test in the presence of an hydatid mole or a chorionepithelioma. Hence, in clinically doubtful cases, a curettement should be carried out in spite of the negative test. Thus far the cases reported have been hydatid moles or metastases of chorionepithelioma. The two cases reported by Tuchschmid were instances of primary chorionepithelioma of the uterus. In the first case, the neoplasm involved the entire uterine wall to the serosa, yet the biologic test was negative for both the urine and the blood. Such cases cannot be explained by Aschheim's assumption that the negative test in some cases of hydatid mole is due to long retention of the mole.

J. P. GREENHILL.

Horta, G.: Wertheim's Operation in Cancer of the Cervix, Rev. de ginec. e d'obst. 37: 172-176, 1943.

The author states that the absence of radium and of apparatus for deep roentgen therapy at the hospital of his city imposes recourse to surgery as effective or palliative treatment of cancer of the cervix. Preference goes to Wertheim's operation because the hypogastric lymph nodes are involved in 20 per cent of tumors strictly limited to the cervix and in 50 per cent of those in which the parametrium is slightly infiltrated.

Of 142 cases, 26 were of grade 1, 35 of grade 2, 31 of grade 3, 23 of grade 4, and 27 were not classified because of insufficient description of the gynecologic examination. Eighty cases were inoperable, 8 patients refused operation and 54 were submitted to Wertheim's operation. The latter included 19 cases of grade 1, 21 of grade 2, 2 of grade 3, 6 of grade 4 and 6 unclassified ones.

Fifteen patients died of operative complications, a mortality rate of 27.7 per cent. Eleven patients survived without signs of local or distant recurrence for from 1 to 13.5 years (six survived five or more years). Fourteen patients died of various causes, including recurrence and metastasis, from a few days to four years after operation.

J. P. GREENHILL.

Otken, L. B.: Primary Melanotic Sarcoma of the Ovary, Am. J. Surg. 55: 160, 1942.

According to the author, a careful review of the literature reveals only 6 cases of true primary melanotic sarcoma of the ovary, although many reports of metastatic melanotic tumors are to be found. He now adds a seventh case occurring in a 33-year-old white nulligravida. Her symptoms consisted of lower abdominal pain and menorrhagia of at least 1 year in duration. At the time of admission to the hospital, the symptoms and signs were those of a twisted ovarian cyst. At operation, bilateral hemorrhagic ovarian neoplasms were found, the left twisted, necessitating the removal of the uterus, tubes, and ovaries. Sections from the tumor were submitted to 3 competent pathologists all of whom concurred in the diagnosis. There were no metastases, and examination 3 months after operation failed to show any evidence of recurrence.

FRANK SPIELMAN.

Cesarean Section

Dubrovsky, R.: Dynamics of the Uterus as an Indication for Cesarean Section, *Obst. y ginec. latino-am.* 2: 22-37, 1944.

Dubrovsky analyzed the cesarean sections which were performed solely for disturbances in uterine action in the Buenos Aires Maternity Institute. There were only 34 such cases, and the small number is due to the conservatism practiced in the author's hospital. If there is no progress in the cervix after ten hours of labor, the author says the obstetrician is justified in performing a cesarean section. The indications for the operation were as follows: cervical spasm and hypertonicity 44.1 per cent, primary hypertonicity 23 per cent, mixed types 14 per cent, etc. In most of the cases, the patient had been in labor more than twenty hours and the bag of waters had been ruptured at least ten hours. Various types of cesarean section were performed. The maternal mortality was 5.9 per cent and there were no fetal deaths.

J. P. GREENHILL.

Leon, J.: Modern Abdominal Cesarean Section, *Rev. Oral de Cienc Med.* 8: Sept. 30, 1943.

The author traces the evolution of the operation and states that the advent of intraperitoneal sulfonamide therapy constitutes a positive advance, but that it is not yet known whether it will allow the transperitoneal cervical cesarean section to be performed safely even in infected women. In the meantime, if the transperitoneal technique is used, all efforts must be made to avoid primary and secondary contamination of the peritoneum even in women with apparently satisfactory conditions of ovular asepsis.

There is no doubt that the defensive techniques contribute to the amelioration of the prognosis in impure cases. Conditions are not as favorable for the use of an intraperitoneal Mikulicz as they are in gynecologic operations, because the puerperal uterus changes its position, form and dimensions. But a gauze drain or tube applied to the muscular wall of the lower segment is certainly useful as a complement of most artificially extraperitoneal cesarean procedures.

At present, intrauterine and intraperitoneal sulfonamide therapy is indicated in transperitoneal and artificially extraperitoneal cesarean sections, and the drug should be continued orally or parenterally, or through an abdominal drainage tube during the subsequent days.

In the cervical cesarean section, the author recommends a curved incision with concavity facing upward, because it offers a number of advantages. He prefers this technique transperitoneally in pure cases; in impure ones, he used his artificial extraperitoneal method of fixation of impermeable pads to the edges of the visceral peritoneum), and sulfonamide therapy with both techniques. Up till now, there has been no maternal mortality.

J. P. GREENHILL.

Vickers, D. M.: Cesarean Section, *Am. J. Surg.* 63: 168, 1944.

One hundred cesarean sections, in a series of 2,192 deliveries performed at a rural hospital in New York State, are reported, an incidence of 4.4 per cent. There was no maternal mortality, but 12 fetal deaths included 4 stillbirths and 8 in the neonatal period. The type of operation used in all cases was low classical with reflexion of the bladder peritoneum, low vertical uterine incision, and only partial peritonealization of the latter by means of the bladder flap. Indications and contraindications for operation are discussed, and the importance of early operation, when indicated, stressed.

FRANK SPIELMAN.

Endocrinology

Von Wattenwyl, H.: A New Method of Administering Estrogenic Substances, Schweiz. med. Wchnschr. 74: 159, 1944.

A few years ago Freed and Greenhill employed aqueous suspensions of estrone to overcome the disadvantages of implanting pellets of estrogenic substance used for the purpose of relieving symptoms of the menopause. The encouraging results obtained by means of this procedure led Wattenwyl to try it at the Basel Woman's Clinic. Among the sixteen women treated, the distressing menopausal symptoms began in 7 after a natural menopause, in 6 after operative castration and in 3 after irradiation of the ovaries. The patients were relieved of their distress by means of the aqueous suspensions and in order to rule out psychic influences, the author performed endometrial biopsies in 3 cases. In two he found distinct evidence of proliferation. The author agrees with Freed and Greenhill that aqueous suspensions give more marked relief than equal amounts of estradiol dipropionate in oil, but they did not observe a prolonged effect. They admit, however, that the rate of absorption of the hormone depends not on the aqueous medicine, but on the type of hormone used and the form and size of the crystals.

J. P. GREENHILL.

Schuermann, F.: Hormone Therapy of Postclimacteric Hearing Disturbances in Women, Schweiz. med. Wchnschr. 74: 1944, 1944.

The author selected a group of twenty women between 40 and 61 years, all of whom were in the menopause. In all, the complaint was increased hearing disturbances, roaring sounds and pressure sensation in the ears following the climacteric. By administering injections of 5 mg. of estrogen intramuscularly a number of times, the disagreeable symptoms were relieved but the hearing was not improved.

J. P. GREENHILL.

Powell, Tracy O.: The Lymphatics of the Female Urinary Bladder, Surg., Gynec. & Obst. 78: 605, 1944.

The lymphatic drainage of the female urinary bladder was studied by means of injection of the submucosa with India ink. For this problem, human cadavers were used. As a general rule, the lymphatic network was found to begin in the submucosa and progress laterally to either side. Here, they joined larger collecting vessels which contained valves. The lymphatics of the anterior wall join the large lateral collectors which in turn run down along the course of the obliterated hypogastric arteries toward the bladder neck. They then turn laterally to the primary nodes. Unlike these, the collectors of the posterior wall progress separately to the regional nodes. The large network of lymphatics around the neck of the bladder connects with those of the posterior wall and also the cervical lymphatics. While there are few anastomoses between the lymph vessels of the anterior wall across the midline, such junctions abound on the posterior wall. The posterior abdominal lymph nodes drain not only the bladder but the other pelvic organs as well.

L. M. HELLMAN.

Correspondence

Therapeutic Abortion

To the Editor:

The recently published paper by Drs. Cosgrove and Carter entitled "A Consideration of Therapeutic Abortion" has interested and puzzled me a great deal. The incidence of therapeutic abortion which they cited for the Johns Hopkins Hospital, namely, 1 to 35 deliveries, is precisely correct for the particular year chosen, 1941 to 1942. The implication is, of course, that this figure is representative of the practice in this department. Being rather startled to find our clinic with the unenviable distinction of topping the list—indeed, of far exceeding all the other clinics mentioned in the incidence of the operation, I have reviewed the figures in our yearly reports since 1927 (the first year such a report was issued). The results are shown in the accompanying table, which brings out two main facts.

TABLE I

THE INCIDENCE OF THERAPEUTIC ABORTION AT THE JOHNS HOPKINS HOSPITAL, 1927 TO 1944. UP TO 1942, THE PERIOD COVERED BY EACH YEAR DESIGNATED WAS A TWELVE-MONTH INTERVAL ENDING AUGUST 31 OF THAT YEAR. THE STATISTICS WERE PUT ON THE BASIS OF THE CALENDAR YEAR IN 1943

YEAR	THERAPEUTIC ABORTIONS	DELIVERIES	PER CENT DELIVERIES	RATIO	
1927	13	1,114	1.2	1:860	Ratio 1927 to 1935 1:55
1928	6	1,094	0.5	1:182	
1929	7	1,033	0.7	1:148	
1930	22	1,120	2.0	1:510	
1931	32	1,053	3.0	1:330	
1932	27	1,120	2.4	1:410	
1933	20	1,193	1.7	1:600	
1934	31	1,224	2.5	1:390	
1935	28	1,216	2.3	1:430	
1936	23	1,583	1.5	1:690	Ratio 1936 to 1944 1:65
1937	26	1,645	1.6	1:630	
1938	12	1,935	0.6	1:161	
1939	38	1,876	2.0	1:490	
1940	24	1,831	1.3	1:760	
1941	29	1,704	1.7	1:590	
1942	55	1,903	2.9	1:350	
1942*	8	700	1.1	1:880	
1943	18	1,880	1.0	1:104	
1944†	18	1,341	1.3	1:740	
Total	437	26,565	1.6	1:610	

*Four-month period ending 12/31/42.

†First nine months.

The fact that our incidence of therapeutic abortion during the past decade or so is about one-half the figure cited is probably of minor importance, because even with a ratio of 1:65 we still lead the list and still remain about as far away as ever from the almost astronomical figure of 1:16,750 at the Margaret Hague Maternity.

The second fact shown by the table is this: Throughout the eighteen-year period covered, although there have been marked fluctuations from year to year, the incidence has been about the same for any given period provided a sufficient number of years are grouped to avoid sampling errors. Thus, in the first nine-year period shown, the frequency was 1 to 55 and during the second nine years,

1 to 65. This holds true despite the fact that the clinic has had three department heads over the eighteen-year interval (J. W. Williams, 1927 to 1931; J. M. Bergland, 1932 to 1936; myself since 1936). Now, it is rather hard for me to believe that the obstetric conscience of all three of us should differ from that of Dr. Cosgrove as widely as the tremendous difference in figures would indicate, and I have been groping for an explanation.

My chief quandary is this: How in the world can one practice good obstetrics (and I do know that the practice of obstetrics at the Margaret Hague Maternity is excellent) with a therapeutic abortion rate of only 1 to 16,750 deliveries? If an incidence of 1 to 500 was cited, or even 1 to 1,000, I would have regarded the report with envy and esteem, but 1 to 16,750 leaves me bewildered.

A slight suggestion of an answer to my query presented itself in connection with the three cases of severe hypertensive, vasculorenal disease which were not aborted. Only three cases of severe hypertensive vasculorenal disease in 67,000 deliveries! For some reason or another we see every year, in less than 2,000 deliveries, five or six comparable patients, each with fresh retinal hemorrhages and growing exudates in addition. And, is it possible that in the vast series there has not been a single case of carcinoma of the cervix complicating an early pregnancy? Nor a single early pregnancy in a woman with known rheumatic heart disease and a history of recent cardiac failure? After thinking the problem over, about the only conclusion I can reach is that cases of this sort, and similar ones in which "the imminence of lethal risk to the mother" is incontrovertible, rarely reach the Margaret Hague Maternity. Can it possibly be that the views stated in this article, have been so thoroughly voiced in Jersey City over the years that cases requiring interruption are referred elsewhere?

If there be any truth in the thought expressed in the foregoing paragraph, it follows as a natural sequence that some other hospital or hospitals in Jersey City will receive for consideration a disproportionately large number of cases in which therapeutic abortion is indicated. Even though that hospital may follow rigid criteria in determining the necessity for interference in this referred material, its incidence of therapeutic abortion will be high if judged by average statistics or the statistics of clinics which tend to sidestep the unpleasant responsibility of such cases. Local circumstances and prejudices play a most important role in this problem of incidence. Certainly, here in Maryland they represent probably the chief factor in the frequency of therapeutic abortion in the various hospitals.

One other point deserves consideration. The presentation in question emphasizes fetal wastage but ignores the ultimate maternal mortality which is implicit in too rigorously withholding therapy. Indications for therapeutic abortion must be based upon experience with the risks which threaten the lives of sick pregnant women. No obstetrician of integrity advocates departure from such indications, but in stressing the necessity of strict standards, it must not be forgotten that reduction in maternal mortality is still the paramount aim of modern obstetrics.

BALTIMORE, MD.
OCTOBER 5, 1944.

NICHOLSON J. EASTMAN, M.D.

Reply by Dr. Cosgrove

To the Editor:

In reply to Dr. Eastman, I desire to comment as follows:

First, please believe there was no invidious purpose in having picked out a particular year which showed this incidence of therapeutic abortions especially high. In all the figures quoted, I strove to get the most recent figures available, so as to reflect current practice. Had we had an incidence which made possible a compilation of our figures in relation to similar short periods, I would have reported ours on that basis. But it is perfectly obvious why I could not do this.

I stated specifically in my paper that I did not in the least desire to sit in judgment on other men's conscientious acts, nor to question the conscience of any individual. Certainly no one would dare to impugn the high ideals and conscience of men like Profs. Williams, and Bergland and Dr. Eastman. My effort was to establish a common criterion for the application of conscientious activities, and by quoting our broad experience, to perhaps rid men's minds of what I believe are in many cases "bugaboos" in the mental approach to the relation between obstetrics and other conditions. In this connection, it is entirely possible that concepts accepted by Dr. Williams many years ago may have influenced the thought in his clinic through all the years since.

The fact that we only aborted three cases of vasculorenal disease does not at all mean that those were the only cases of this condition we have seen in our material. It merely means that our attitude even toward these very ominous cases is perhaps different from that of other clinics. I attempted some discussion of this attitude in my paper.

We do seem, in this community, curiously, to see relatively few carcinomata of the cervix in childbearing women. I have checked this matter in the experience of several of the most competent and active members of our staff, in relation to their very large private material. However, the fact that we would not abort them, that is, attempt emptying the uterus as a special, separate procedure, does not at all mean we would withhold proper treatment of such cases. We would subject them to irradiation or extirpation of the uterus, or any combination of such measures judged best in the individual case, without regard to the presence of a conceptus in the diseased uterus. This because we think this is better treatment than the prior or simultaneous employment of surgery to empty the uterus. Even the spontaneous expulsion of the conceptus through the diseased cervix is a less dangerous trauma than, for instance, hysterotomy.

Of course, we have seen numbers of cases of known rheumatic heart disease, some of them with history of recent failure, or in actual failure when seen. Here again, our attitude is that abortion is not a justifiable procedure to apply to these cases. Instead we place great emphasis on adequate medical treatment of these conditions, believing that we are justified in our experience in concluding that if the medical control and treatment are adequate, the pregnancy may be virtually ignored except as emphasizing the stringency of medical control necessary.

Dr. Eastman's belief that a disproportionate number of cases legitimately necessitating therapeutic abortion are diverted to other institutions in the territory of the Margaret Hague Maternity Hospital by reason of the known attitudes of our own staff, is of course one which immediately occurs to the mind of anyone considering the local situation, and I have been at some pains to ascertain how far this may be true.

In a period during which this hospital delivered over 7,000 living births, there were 4,292 living births in other institutions in the county, the same area served by the Margaret Hague Maternity Hospital. Among these 4,292 living births, I have been able to obtain a record of only four therapeutic abortions, two for diabetes, one for tuberculosis and one for pyelonephritis. This is a rate of one in 1,073, definitely higher than our own published rate, but still by no means high enough to give credence to the belief that the other hospitals in this community practice therapeutic abortion in a disproportionate ratio.

Of course there are two unrecognized hospitals in this area, both small, where the incidence of abortion might well be in higher ratio than is consistent with any standard of good practice. These hospitals, however, are not attended by such men of good conscience as we like to think of ourselves being, and therefore, the work done therein would be quite beyond the pale of our discussion. Undoubtedly, such institutions also exist in other representative communities.

I will by no means plead guilty to inclusion in those "clinics which tend to sidestep the unpleasant responsibility of such cases." This clinic has never re-

fused to care for *any* case presented to it, nor transferred any case to another institution in an effort to sidestep *anything* unpleasant in relation to care of material coming to it. There are a number of men on this staff, including myself, who have done therapeutic abortions, and would have no hesitation whatever in inducing abortion if they honestly believed it necessary. I am glad to say that these men, with one possible exception, concur in the belief that the ultraconservatism of this clinic in relation to therapeutic abortion is good obstetrics.

One further point I would take issue on. Dr. Eastman states we ignore "the ultimate maternal mortality which is implicit in too rigorously withholding therapy." We do not ignore what is called the ultimate maternal mortality. But we do feel that this is a factor difficult to calculate, and that it may be conserved at least as well by additional emphasis on the medical treatment of complicating conditions, as by resort to a procedure that does utterly ignore the inherent right to life of human beings.

It occurs to me that there is perhaps one great difference in the experience of our two clinics. Johns Hopkins is eminently a referral and consultation center for a large area of the country. Ours serves only a relatively limited locality. The graduates of Johns Hopkins look to it for help in their own problems, and refer their own difficulties for solution on a relatively tremendous scale. It is probably true that many of his most difficult problem cases come to Dr. Eastman's service from more or less great distances. Inasmuch as this is true, it may very well be that he has an overload of those cases concerning which individuals superficially as different as he and myself in our approach to them, might conceivably get much closer together in our consideration of those particular cases.

Finally, I think that the work and results of this clinic sufficiently attest that we are alert to the reduction of maternal mortality as the paramount aim of modern obstetrics. As society realizes increasingly the necessity for adequate medical care of handicapped obstetric patients of every sort, the closer we will be to the possibility of staying true to that paramount aim, and, at the same time, of applying stricter standards than we have heretofore been able to, in respecting the rights of the unborn.

S. A. COSGROVE, M.D.

JERSEY CITY, N. J.

OCTOBER 30, 1944.

Is Abortion Murder?

To the Editor:

In an article entitled "A Consideration of Therapeutic Abortion" and published in the September, 1944, issue of the JOURNAL, the author employs the word "murder" in describing the procedure. Now in my belief, murder is an unpleasant and ugly word. His definition of murder: premeditated destruction of human life, is excellent as far as it goes, but it does not go far enough. One word is needed for completion, namely, malice. Because he has incorporated the word premeditated in definition, one would imply that destruction of human life is not murder unless it is premeditated, and I merely call attention to the fact that the premeditation must be with malice. I substantiate my viewpoint with definitions from Webster's International Dictionary.

Murder—n—The offense of killing a human being with malice, pretense, or aforethought, express or implied; intentional and unlawful homicide.

Murder—v—To kill with premeditated malice; to kill (a human being) willfully, deliberately and unlawfully.

Manslaughter—(law) The unlawful killing of a man, either in negligence or incidentally to the commission of some unlawful act, but without specific malice, or upon a sudden excitement of anger.

Homicide—(hom o man—caedere to cut) The killing of one human being by another. Homicide is of three kinds: justifiably, as when the killing is performed in the exercise of a right or performance of a duty; excusable, as when

done although not as a duty or right, yet without culpable or criminal intent; and felonious or involving what the law terms malice; the latter may be either manslaughter or murder.

Because of the incomplete definition, I believe Dr. Cosgrove has been led somewhat astray. What frequently is spoken of as murder and justifiable murder is not murder at all, as no malice is involved, either according to law or the conscience of the individual. It is homicide.

PITTSFIELD, MASS.

OCTOBER 4, 1944.

T. W. JONES, M.D.

Reply by Dr. Cosgrove

To the Editor:

In response to the above letter from Dr. Jones, I desire to comment as follows:

I am pleased that my article elicited your interest sufficiently to inspire so painstaking a commentary, and appreciate your expressing your enjoyment of it.

Of course "murder is an unpleasant and ugly word." That is one reason that I deliberately used it, to arrest attention and provoke serious thought. And, of course, I had not failed to familiarize myself with all the definitions quoted by Dr. Jones before using it.

But, in cognizance of all that he says as to its meaning, and granting that in the destruction of the previable fetus the operator is not actuated by *personal* malice ("enmity of heart; malevolence; ill-will"), yet that destruction can hardly be conceived to be activated by charity toward the creature destroyed.

In extension of this thought, part of Dr. Jones' own quoted definition says that the word murder used as a noun is, "The offense of killing a human being with malice, pretense, or aforethought, express or implied."

Please note the last word of that quotation; the "malice" need only be implied. This qualification is illuminated by part of the definition of malice according to the same dictionary on which you rely, as follows: "Malice, *n* . . . 4. *Law* . . . legal malice . . . does not necessarily consist in *malice in fact*, or actual malevolence toward the person injured . . . it may consist in *implied malice*, that is . . . wanton disregard of the rights of others."

Therefore, murder may in some cases be adequately defined as the premeditated killing of a human being with wanton disregard of the rights of the victim. So defined, I consider my use of the word murder to designate the destruction of a fetus to be entirely justified.

SAMUEL A. COSGROVE, M.D.

JERSEY CITY, N. J.

OCTOBER 16, 1944.

Postgraduate Education for Returning War Doctors*

To the Editor:

The receipt of an inquiry from the American Board of Obstetrics and Gynecology regarding the assignment, work, and disposition of Diplomates by the Armed Forces is further reassuring evidence of the group's interest in the integrity and improvement of the specialty, and implies a desire to aid the younger men who have been temporarily detached from orthodox practice and training.

It is evident that the Medical Bureaus of the various services have devoted much time and thought to the disposition of Medical Officers. The discrepancies are rare and are usually temporary. This is truly remarkable when the enormity, exactness, and grimness of the business of waging this war is considered; where a functioning doctor is the prime need and desire is necessarily secondary. It is

*The opinions or assertions contained herein are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large.

logical that the men in this specialty wished general duty, since the dependent clinics and Women's Corps constitute the only billet for such special work. The services are serious in their desire that the men be assured that their families will be cared for through regular private arrangements when practicable. Soon the gynecologically and/or obstetrically trained officers meet with only mild hilarity the frequent interrogation, "Who in the Army and/or Navy is going to have a baby?" It is the military counterpart of the compelling perennial of "never having lost a father."

It is right that the Board should be concerned about the potential and avowed candidates who were preparing for this specialty. The training that allowed the specialist to carry on the duties of a Medical Officer should be reciprocal, certainly in the foundation. It is unnecessary to recall the similarity in problems of hemorrhage, shock, infection, prophylaxis, and various medical and surgical complications regardless of the type of practice. These men are familiar with morbid processes.

In talking with these younger men, one is impressed with their eagerness to complete their formal training. The first information they seek is that concerning opportunities that might be available for them after the war. They are proud of the sacrifice that the institutions have made and of the splendid manner in which they have maintained their professional integrity during trying times and would be most reluctant to see the training standards lowered. There is no desire to take the place of the regularly appointed residents who were called away. The simple question is, "Will it be possible to secure an association with recognized groups where information and methods can be brought up to date, with possible recognition by the Boards?"

One who has attended the meetings of the two national societies, the Obstetric Congress, the various sectional groups, and the sections of the larger general associations is constantly impressed by the spontaneous and genuine interest of these leaders in the younger men and their eagerness to assist in the training. In all probability, measures have already been initiated by these groups and it is anticipated that the so-called "G-I Bill of Rights" will be a help, however, this is not generally known by the men in detached stations.

In a recent communication from Dean Davison, of Duke University Medical School, the writer was not surprised to hear that plans are being considered to aid men who desire Pediatric training. The plan would easily be applicable in obstetrics and gynecology throughout the United States. North Carolina is a "rural" state, has three medical schools that live in relative harmony. The men stick to their specialty, good hospital facilities are available, and the majority of the recognized specialists are Board members. The medical schools would receive and evaluate the applications, assign the applicants to the participating institutions and specialists, and the faculty's members would aid in the instruction if needed. The men could be rotated and brought together at intervals. The matter of costs, etc., could be agreed upon. This one plan, and it could easily be the wrong one, suggests the possibility of exercising the grand American prerogative of appointing a committee, which sometimes leads to definitive action.

The returning Medical Officers are used to a fairly rugged life. Many have not participated in competitive practice. Their way of living is adjusted to a fixed income and, except during combat, their work and rest are regulated. Under such circumstances it is easily understood why many will be content to work for some agency. The usual interest and manifest altruism of the splendid societies previously mentioned should adequately prove the advantage of the system of medicine as generally practiced throughout America. The postwar transition probably will not be so difficult and can be accomplished with few dislocations.

ROBERT A. ROSS,
COMMANDER (MC) USNR.

OCTOBER 14, 1944.

Items

Urology Award

The American Urological Association offers an annual award "not to exceed \$500" for an essay (or essays) on the result of some specific clinical or laboratory research in urology. The amount of the prize is based on the merits of the work presented, and if the Committee on Scientific Research deem none of the offerings worthy, no award will be made. Competitors shall be limited to residents in urology in recognized hospitals and to urologists who have been in such specific practice for not more than five years. All interested should write the Secretary, for full particulars.

The selected essay (or essays) will appear on the program of the forthcoming June meeting of the American Urological Association.

Essays must be in the hands of the Secretary, Dr. Thomas D. Moore, 899 Madison Avenue, Memphis, Tennessee, on or before March 15, 1945.

American Board of Obstetrics and Gynecology

Examinations

The next written examination and review of case histories (Part I) for candidates will be held in various cities of the United States and Canada and by special arrangements at Army and Navy Stations on Saturday, February 3, 1945, at 2:00 P.M. Candidates who successfully complete the Part I examination proceed automatically to the Part II examination held later in the year. All applications for this year's examinations must be in the office of the Secretary by November 15, 1944.

Arrangements will be made so far as is possible for candidates in Military Service to take the Part I examination (written paper and submission of case records) at their places of duty, the written examination to be proctored by the Commanding Officer (medical), or by a Medical Officer designated by him. Material for the written examination will be sent to the proctor several weeks in advance of the examination date. Candidates in Military Service who wish to do so may send their case records in advance of the examination date to the office of the Secretary. All other candidates should present their case records to the examiner at the time and place of taking the written examination.

The Office of the Surgeon General (U. S. Army) has issued instructions that men in Service, eligible for Board examinations, be encouraged to apply and that they may be ordered to Detached Duty for the purpose of taking these examinations whenever possible. The Office of the Surgeon General of the U. S. Navy presumably takes a similar attitude on this matter.

The place of the Board's Part II examination in May or June, 1945, has not yet been decided, but it is likely to be held in that city nearest to the largest group of candidates. The exact time and place will be announced later.

If a candidate in Service finds it impossible to proceed with the examinations of the Board, so that his plans are thus interrupted, deferment of parts of these without time penalty will be granted under a waiver of our published regulations covering civilian candidates.

For further information and application blanks, address Dr. Paul Titus, Secretary, 1015 Highland Building, Pittsburgh (6), Pennsylvania.

OCTOBER 19, 1944.

PAUL TITUS, M.D.

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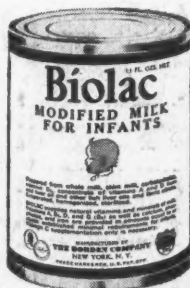
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